

San Diego Integrated Regional Water Management Implementation Grant Proposal Economic Analysis – Water Supply Costs and Benefits

Attachment 7 consists of the following items:

- ✓ **Water Supply Costs and Benefits.** The body of this attachment provides an overview of the water supply costs and benefits of this proposed funding package, as well as the benefits associated with each individual project.
- ✓ **Appendix 7-1.** Appendix 7-1 provides a detailed discussion of the estimated avoided future imported water costs from developing local supplies in the San Diego region.
- ✓ **Appendix 7-2.** Appendix 7-2 of this attachment contains detailed information and background regarding the qualitative and quantitative costs and water supply benefits of each individual project contained within this proposal.

This attachment contains estimations of the water supply-related costs and benefits of each project contained within this *San Diego IRWM Implementation Grant Proposal*. Because several projects are being proposed with multiple benefits, Table 7-1 below contains a summary of the costs and benefits for all projects.

Section 1 provides a summary of the regional water supply background, and justification for the avoided costs of imported water supplied by the Metropolitan Water District of Southern California (MWD) and the San Diego County Water Authority (SDCWA). Appendix 7-1 contains a more detailed discussion and water rate tables used in the analysis avoided costs of imported water analysis.

Section 2 contains a narrative description of the expected costs that may be incurred to implement and operate each project, and to achieve benefits from each project. Appendix 7-2 also contains all costs associated with each project that are necessary to accomplish full implementation of each project and achievement of the stated benefits.

Section 3 contains a narrative description of the expected water supply benefits of each project. Where possible, each benefit was quantified and presented in physical or economic terms. In cases where quantitative analyses were not feasible, this attachment provides complimentary qualitative analyses. In addition, this attachment provides a description of economic factors that may affect or qualify the amount of economic benefits to be realized. This attachment also includes a discussion regarding uncertainties about the future that might affect the level of benefit received. Appendix 7-2 contains detailed information regarding the benefits anticipated to occur as a result of this proposal.

1. Regional Water Supply Background

The San Diego region comprises eleven parallel and similar hydrologic units that discharge to coastal bays, estuaries, or lagoons. Due to low and unreliable quantities of precipitation, the region has a limited local water supply and has therefore depended largely on imported water from Northern California rivers, the Bay Delta, and the Colorado River for over sixty years. The adopted San Diego IRWM Plan recognizes that it is important to increase the local water supply, which is reflected in Goal 1 of the IRWM Plan: *optimize local water supply reliability*.

Table 7-1: Water Supply Costs and Benefits Summary

#	Project	Project Sponsor	Total Present Value Project Costs	Total Present Value Water Supply Benefits
1	Sustainable Landscapes Program	San Diego County Water Authority	\$1,157,709	\$140,576
2	North San Diego County Regional Recycled Water Project	Olivenhain Municipal Water District	\$17,199,249	\$61,324,268
3	North San Diego County Cooperative Demineralization Project	San Elijo Joint Powers Authority	\$27,802,301	\$55,645,552
4	Rural Disadvantaged Community (DAC) Partnership Project	Rural Community Assistance Corporation	\$707,463	\$172,718
5	Lake Hodges Water Quality and Quagga Mitigation Measures	San Diego County Water Authority	\$1,517,868	\$41,783,290
6	Implementing Nutrient Management in the Santa Margarita River Watershed	County of San Diego	\$1,534,082	\$40,866,899
7	Bannock Avenue Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection	City of San Diego - Storm Water Department	\$4,168,512	\$0
8	Pilot Concrete Channel Infiltration Project	City of Santee	\$281,294	\$0
9	San Diego Regional Water Quality Assessment and Outreach Project	San Diego Coastkeeper	\$924,578	\$0
10	Chollas Creek Integration Project	Jacobs Center for Neighborhood Innovation	\$1,018,096	\$0
11	Regional Water Data Management Program	County of San Diego	\$540,043	\$0
	TOTAL		\$56,851,195	\$199,933,303

The San Diego County Water Authority (SDCWA) purchases the majority of the region's imported water (sourced from the State Water Project (SWP) and the Colorado River Aqueduct (CRA)) from the Metropolitan Water District of Southern California (MWD), and receives additional imported supplies from the Colorado River through a conservation and transfer agreement with the Imperial Irrigation District (IID). SDCWA, as the only water wholesaler within the Region, distributes the aforementioned supply to its 24 member agencies, which include all major water agencies in the San Diego region. The amount of water imported into the region varies depending on hydrologic conditions, but in general the region's water supply consist of 70 to 90 percent imported water. In 2008, approximately 88 percent of the region's water supply was imported, 76 percent of this water was purchased by SDCWA from MWD, and the remaining 12 percent came from the Colorado River (through the IID transfer). The remaining water supply in the region consists of conservation, recycled water, local surface water, and groundwater, with approximately 10 to 30 percent coming from these sources. It is anticipated that future water supplies may also consist of desalinated water, although this water sources is not currently available for the region.

One of the most significant issues for the region is the availability and reliability of its imported water supplies. The SWP is the major source of imported supply, followed by water from the CRA. Recent legal decisions to protect the endangered Delta smelt have drastically reduced the amount of Delta pumping that can be conducted, cutting back on the volume of SWP water that can be delivered. This situation, coupled with the recent droughts affecting both the SWP and CRA and further reducing available supplies, serves as a reminder that the region's water supply is vulnerable to events outside the region. The region faces a critical need for improved local supplies, and local water agencies have identified the need to increase local supplies as a key element in meeting future regional water demands.

Absent increased conservation efforts, as well as cultivation of local surface water, groundwater, desalinated water, and recycled water supplies, the region will continue to be vulnerable to unreliable imported supplies, and will continue to suffer the economic consequences of additional cutbacks in imported supplies. This trend of will continue until the region develops reliable local supplies.

Avoided Cost of Imported Water

As described above, imported water supply in the San Diego region constitutes approximately 70 to 90 percent of the region's water supply. Water produced by conservation, recycling, groundwater extraction, and other "local sources" will offset the need to use imported water supply. The value of adding new local supplies can thus be estimated based on the costs avoided by reducing local demands for imported water. Appendix 7-1 provides a detailed description of the local water supply and methodology used for calculating the avoided cost of imported water.

The avoided cost of purchasing imported water from SDCWA are calculated based on MWD's Tier 1 water rates and include additional SDCWA and MWD fixed charges. Table 7-2 shows the total "all in" rates for imported water supply from SDCWA. The total "all in" water rates for M&I supplies purchased from SDCWA are \$864 for untreated water and \$1,079 for treated water (in 2010 dollars). Appendix 7-1 provides a detailed table of SDCWA projected real treated and untreated water rates for 2009-2060 (in 2009 dollars) used for the economic analysis.

These values are used in the avoided cost analysis for all San Diego region projects except the Implementing Nutrient Management in the Santa Margarita River Watershed project, for which MWD's water rates are used for Rancho California Water District (RCWD) imports.

Table 7-2: San Diego Region Water Rates Effective January 1, 2011 (\$2010)

	Untreated (\$/AF)	Treated (\$/AF)
Volumetric Charges¹		
Melded Supply Rate	\$597	\$812
Transportation	\$75	\$75
Melded Tier 1	\$672	\$887
Fixed Charges (in Volumetric Terms)¹		
Storage	\$95	\$95
Customer Service	\$44	\$44
Total Fixed Charges	\$139	\$139
Total SDCWA Costs for M&I Water	\$811	\$1,026
Additional MWD Fixed Charges²		
Capacity Charge	\$14	\$14
Readiness to Serve Charge	\$39	\$39
Total "All In" Costs for M&I Water	\$864	\$1,079

Sources:

1 San Diego County Water Authority. June 24, 2010. Public Hearing: Recommended CY 2011 Rates and Charges.

2 City of San Diego. October 27, 2010. CY 2011 Rate Fact Sheet: SDCWA Water Rates for the City of San Diego Effective January 1, 2011.

Rancho California Water District (RCWD), who serves water to customers in the Riverside County portion of the shared Santa Margarita River watershed, purchases water imports from MWD through Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD). RCWD is a project partner in the *Implementing Nutrient Management in the Santa Margarita River Watershed* project being jointly proposed by the San Diego and Upper Santa Margarita regions. Annual imported water purchases by RCWD totaled 51,000 AFY in 2005, or 53 percent of supply.¹ As described in Appendix 7-1, the avoided costs of importing water from RCWD are calculated based on MWD's Tier 2 untreated water rates. Appendix 7-1 provides a detailed table of MWD projected real Tier 2 untreated water rates for 2009-2060 (in 2009 dollars) used for the economic analysis of that specific project only.

¹ Rancho California Water District. 2005. Urban Water Management Plan Update.

Project-Specific Avoided Costs

In addition to avoiding water imports, which would affect the San Diego region's water supply availability, there are project-specific avoided costs that need to be considered and included on a project-by-project basis. For example, an indirect potable reuse (IPR) project would have both the avoided cost of importing water plus the avoided cost of off-loading wastewater treatment and ocean discharge. Another example is a new local groundwater source that is of high enough quality that it can be put directly into the potable system; thus, avoiding the cost of conventional potable treatment [of raw imported water]. Each project assessed below contains a discussion of project-specific avoided costs.

1. Total Costs of Proposed Projects

The following sections provide information about the total project costs associated with each proposed project within this *San Diego IRWM Implementation Grant Proposal*. The summary of total project costs is based on Table 11 in DWR's Implementation Grant Proposal Solicitation Package (DWR 2010), inclusive of the project budget information contained in Attachment 4. Appendix 7-2 contains the complete Table 11 export for each proposed project.

Project 1: Sustainable Landscapes Program

The total estimated budget for the *Sustainable Landscapes Program* is \$1,400,000 for a total present value \$1,157,709 (in 2009 dollars). The total costs for the project are equivalent to the project budget, which is described in detail in Attachment 4. The cost benefit analysis for this project claims benefits from work detailed within the Work Plan for this project (refer to Attachment 3). As such, no further costs need to be spent to accrue the benefits presented within Attachments 7 through 10 of this Proposal.

Capital costs for this project would be expended between 2010 and 2014, with the largest capital cost in construction and implementation. Costs for administration and operation would also be expended between 2010 and 2014. Detailed cost information associated with the project, including present value calculations is presented in Appendix 7-2.

**Table 7-3: Total Project Costs
*Sustainable Landscapes Program***

Phase	Cost
<i>Sustainable Landscapes Program</i>	\$1,400,000
Total Present Value of Discounted Costs	\$1,157,709

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 2: North San Diego County Regional Recycled Water Project

The total estimated budget for the *North San Diego County Regional Recycled Water Project* is \$2,000,000 (refer to Attachment 4). In order to fully implement the *North San Diego County Regional Recycled Water Project* and accrue all aforementioned water supply benefits, however, the project sponsor would need to also complete activities that are not included in the proposed budget. The total capital costs for the proposed project (\$2,000,000) and additional phases (\$13,500,000) are estimated to be \$15,500,000. Additionally, O&M costs are estimated to be \$455,000 annually and replacement costs are estimated to be \$113,750 annually. Implementation of the entire project results in a total present value of \$17,199,249 (in 2009 dollars).

Capital costs would be expended between 2011 and 2017 and maintenance costs will be expended from 2016 to 2060, with the largest capital cost in construction and implementation. The operation and maintenance costs are estimated to be \$568,750 annually. Detailed cost information associated with the project, including present value calculations is presented in Appendix 7-2.

Table 7-4: Total Project Costs
North San Diego County Regional Recycled Water Project

Phase	Cost
<i>North San Diego County Regional Recycled Water Project Capital Costs</i>	\$2,000,000
Final 100% design of regional recycled water connections	\$500,000
Environmental compliance and permitting for regional recycled water connections	\$500,000
Construction of regional recycled water connections ¹	\$12,500,000
Total Capital Costs	\$15,500,000
<i>North San Diego County Regional Recycled Water Project O&M / Replacement Costs</i>	\$25,593,750
Total Present Value of Discounted Costs	\$17,199,249

¹ Construction of regional recycled water connections does not include the recycled water distribution system expansion accounted for under the *North San Diego County Cooperative Demineralization Project*.

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 3: North San Diego County Cooperative Demineralization Project

The total estimated budget for the *North San Diego County Cooperative Demineralization Project* is \$5,384,800 (refer to Attachment 4). In order to fully implement the project and accrue all aforementioned water supply benefits, the project sponsor would need to also complete activities that are not in the proposed budget. The total costs for the proposed project (\$5,384,800) and additional phases (\$28,000,000) are estimated to be \$33,384,800 between 2009-2015. After discounting, the total present value is estimated to be \$27,802,301 (in 2009 dollars).

Capital and implementation costs will be expended through 2012 for the proposed Work Plan (refer to Attachment 3) and would extend into 2015 for Phase II, with the largest capital cost in construction and implementation. The annual operation and maintenance costs are estimated to be \$70,000 throughout the lifetime of the project, and will span from 2009 to 2060. These costs will include labor for daily operation of facilities proposed by the project, energy costs, chemical costs, as well as maintenance costs associated with routine and emergency maintenance as needed. Administration costs will also span over the lifetime of the project, and will include administrative activities such as ordering parts, coordinating with vendors, and tracking costs and time. Replacement costs for the project will be incurred in 2020, 2030, 2040, 2050, and 2060, and will include routine replacement of membranes, pumps, electrical equipment, and other replacement costs as needed over the lifetime of the project. Detailed cost information associated with the project, including present value calculations, are available in Appendix 7-2.

Table 7-5: Total Project Costs
North San Diego County Cooperative Demineralization Project

Phase	Cost
<i>North San Diego County Cooperative Demineralization Project Capital Costs</i>	\$5,384,800
Preliminary and final 100% design for recycled water distribution system expansion to service SEWRF capacity	\$300,000
Environmental compliance and permitting for recycled water distribution system expansion to service SEWRF capacity	\$200,000
Construction of recycled water distribution system expansion to service SEWRF capacity ¹	\$12,500,000
Preliminary and final 100% design of brackish to potable groundwater desalination facility	\$400,000
Environmental compliance and permitting for brackish to potable groundwater desalination facility	\$300,000
Construction of brackish to potable groundwater desalination facility	\$14,300,000
Total Capital Costs	\$33,384,800
<i>North San Diego County Cooperative Demineralization Project O&M / Replacement Costs</i>	\$4,994,000
Total Present Value of Discounted Costs	\$27,802,301

1 Cost estimate based on 'opinion of probable costs' for construction of recycled water facilities in Santa Fe Irrigation District Recycled Water Master Plan (2005); assumes \$13,172-\$15,408 per AF for construction of recycled water system including pump station, underground reservoir, pipelines, service laterals and meters.

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 4: Rural Disadvantaged Community (DAC) Partnership Project

The total estimated budget for the *Rural Disadvantaged Community (DAC) Partnership Project* is \$530,000. The total costs for full implementation of the two sample projects include \$251,000 for *Sample Project 1: MGB Well Rehab and Treatment Plant Renovation* and \$566,000 for *Sample Project 2: SCWWD Robbins Wastewater Rehabilitation*. Assuming that \$505,000 of the proposed budget goes directly to implementing the two sample projects (\$530,000 total project costs minus \$25,000 in grant and project administration), additional capital costs of \$312,000 will be sought from U.S. Department of Agriculture Rural Development, U.S. Environmental Protection Agency Region 9, Indian Health Services, and Rural Community Assistance Partnership. This results in a total present value \$707,463 (in 2009 dollars.)

Capital costs for this project would be expended between 2011 and 2013, with the largest capital cost in construction and implementation. No operations and maintenance costs are included at this time, but other costs would be expended as described above. For purposes of this analysis it was assumed that other project costs would be \$312,000, based on the two example projects selected, and would be incurred in 2011 for implementation of the necessary projects. Detailed cost information associated with the project, including present value calculations is presented in Appendix 7-2.

**Table 7-6: Total Project Costs
Rural DAC Partnership Project**

Phase	Cost
<i>Rural Disadvantaged Community (DAC) Partnership Project</i> Capital Costs	\$530,000
<i>Rural Disadvantaged Community (DAC) Partnership Project</i> Additional Capital Costs	\$312,000
Total Capital Costs	\$842,000
Total Present Value of Discounted Costs	\$707,463

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 5: Lake Hodges Water Quality and Quagga Mitigation Measures

The total estimated budget for the *Lake Hodges Water Quality and Quagga Mitigation Measures* project is \$1,200,000 as described in Attachment 4. In order to fully implement the project and accrue all aforementioned water supply benefits, the project sponsor would need to also complete activities that are not in the proposed budget. Administration and O&M costs are based on SDCWA experience managing the Lake Hodges Pumped Storage Facility. Major maintenance and cleaning is anticipated in 5-year increments. Complete replacement of some facilities is anticipated at 10-year increments. In total, O&M and replacement costs are anticipated at \$1,968,640. This results in a total present value of \$1,517,868 (in 2009 dollars).

Capital costs for the project would be expended between 2010 and 2013 and maintenance costs would be expended in from 2014 to 2060, with the largest capital cost in construction and implementation. The total operation and maintenance costs are estimated to be \$1,968,640. Detailed cost information associated with the Project, including present value calculations is presented in Appendix 7-2.

**Table 7-7: Total Project Costs
Lake Hodges Water Quality and Quagga Mitigation Measures**

Phase	Cost
<i>Lake Hodges Water Quality and Quagga Mitigation Measures</i> Capital Costs	\$1,200,000
<i>Lake Hodges Water Quality and Quagga Mitigation Measures</i> O&M / Replacement Costs	\$1,968,640
Total Project Costs	\$3,168,640
Total Present Value of Discounted Costs	\$1,517,868

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 6: Implementing Nutrient Management in the Santa Margarita River Watershed

The total estimated budget for the *Implementing Nutrient Management in the Santa Margarita River Watershed* project is \$690,000 (refer to Attachment 4). In order to fully implement the *Implementing Nutrient Management in the Santa Margarita River Watershed* project and accrue all aforementioned water supply benefits, however, the project sponsor would need to also complete activities that are not included in the proposed budget. The total capital costs for the proposed project (\$690,000) and additional phases (\$1,510,000) are estimated to be \$2,200,000, for a total present value of \$1,534,082 (in 2009 dollars).

Capital costs would be expended from 2011 to 2014 for the proposed Work Plan (refer to Attachment 3), and would extend into 2018 for Phase II. The project would not require operations and maintenance

costs. Detailed cost information associated with the project, including present value calculations is presented in Appendix 7-2.

Table 7-8: Total Project Costs
Implementing Nutrient Management in the Santa Margarita River Watershed

Phase	Cost
<i>Implementing Nutrient Management in the Santa Margarita River Watershed</i> Capital Costs (Phase I)	\$690,000
Phase II Capital Costs (Additional monitoring, special studies, and development of proposed nutrient WQOs for Santa Margarita River based on the NNE approach)	\$1,510,000
Total Project Costs	\$2,200,000
Total Present Value of Discounted Costs	\$1,534,082

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 7: Bannock Avenue Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection

The total estimated budget for the *Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection* project is \$3,543,300. Administration, O&M, and replacement costs for the project total \$3,551,229 for major cleaning and repair of the storm drain bypass, the hydrodamatic separator, and bacterial treatment system. This results in a total present value of \$4,168,512 (in 2009 dollars).

Capital costs for this project have already been spent (beginning in 2009), and will be incurred through 2014. The largest capital cost is anticipated for construction and implementation. The project will not be operational until 2014, and maintenance costs after construction will span from 2014 through 2043. Operational costs will be spent to maintain the bacterial treatment system, which will require major maintenance and cleaning at 5-year increments throughout their useful life. Maintenance costs are anticipated to increase in increments after each of the aforementioned lifecycle milestones is reached. Replacement costs are anticipated during the project lifetime, from 2014 through 2043. These costs were estimated based on a straight-line depreciation over 30 years of each for the assets constructed and installed as part of the project and which will need to be completely or significantly replaced. Detailed cost information associated with the project, including present value calculations, are in Appendix 7-2.

Table 7-9: Total Project Costs
Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection

Phase	Cost
<i>Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection</i> Capital Costs	\$3,543,300
<i>Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection</i> O&M / Replacements Costs	\$3,551,229
Total Project Costs	\$7,094,529
Total Present Value of Discounted Costs	\$4,168,512

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 8: Pilot Concrete Channel Infiltration Project

The total estimated budget for the *Pilot Concrete Channel Infiltration Project* is \$333,400 for a total present value \$281,294 (in 2009 dollars). The total costs for the project are equivalent to the project budget, which is described in detail in Attachment 4. The cost benefit analysis for this project claims benefits from work detailed within the Work Plan for this project only (refer to Attachment 3). The project will be operational in 2012 and maintenance costs after construction (after 2012) will be minimal, because routine channel maintenance is already conducted by the City of Santee. As such, no further costs need to be spent to accrue the benefits presented within Attachments 7 through 10 of this Proposal.

Capital costs for this project would be expended through 2012, with the largest capital cost in construction and implementation. Detailed cost information associated with the project, including present value calculations is presented in Appendix 7-2. Detailed information regarding the budget for this project is available in Attachment 4.

Table 7-10: Total Project Costs
Pilot Concrete Channel Infiltration Project

Phase	Cost
<i>Pilot Concrete Channel Infiltration Project</i> Capital Costs	\$333,400
Total Present Value of Discounted Costs	\$281,294

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 9: San Diego Regional Water Quality Assessment and Outreach Project

The total estimated budget for the *San Diego Regional Water Quality Assessment and Outreach Project* is \$667,000. Additional costs that will also be incurred during this timeframe include administration, operations, maintenance, and other costs. These costs are anticipated to include salaries, contract fees, and laboratory supplies and will total \$485,000. This project would not include permanent facilities or equipment, which would degenerate operating expenses beyond the life of the project. This results in a total present value of \$924,578 (in 2009 dollars).

Capital and implementation costs for the project will be expended from 2011 to 2014, with the largest capital cost in construction and implementation. Detailed cost information associated with the project, including present value calculations, are available in Appendix 7-2.

Table 7-11: Total Project Costs
San Diego Regional Water Quality Assessment and Outreach Project

Phase	Cost
<i>San Diego Regional Water Quality Assessment and Outreach Project</i> Capital Costs	\$667,000
<i>San Diego Regional Water Quality Assessment and Outreach Project</i> O&M / Other Costs	\$485,000
Total Project Costs	\$1,152,000
Total Present Value of Discounted Costs	\$924,578

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 10: Chollas Creek Integration Project

The total estimated budget for the *Chollas Creek Integration Project* is \$994,500. Administration and maintenance costs are anticipated throughout the project lifetime, in order to maintain the riparian vegetation and remove trash from the restoration area. Operations and replacement costs are limited to irrigation components for the first three years until the planted vegetation matures. All additional costs total \$560,200 for the proposed project. This results in a total present value \$1,018,096 (in 2009 dollars).

Capital and implementation costs for the project will be expended from 2010 through 2013, with the largest capital cost in construction and implementation. The operation and maintenance costs are estimated to consist of administration, operation, maintenance, and replacement costs. Administration and maintenance costs will span from 2012 through 2060, whereas operation costs will span from 2012 to 2015 and replacement costs will be incurred from 2012 to 2014. Detailed cost information associated with the project, including present value calculations, are available in Appendix 7-2.

**Table 7-12: Total Project Costs
Chollas Creek Integration Project**

Phase	Cost
<i>Chollas Creek Integration Project</i> Capital Costs	\$994,500
<i>Chollas Creek Integration Project</i> O&M Costs	\$560,200
Total Project Costs	\$1,554,700
Total Present Value of Discounted Costs	\$1,018,096

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

Project 11: Regional Water Data Management Program

The total estimated budget for the *Regional Water Data Management Program* is \$202,327 for a total present value of \$434,223 (refer to Attachment 4). In order to fully implement the *Regional Water Data Management Program* and accrue all aforementioned water supply benefits, the project sponsor would need to also complete additional activities that are not included in the proposed budget. The total costs for the proposed project (\$203,327), programming of the data platform (\$200,000), and startup of the datasets (\$150,000) are estimated to be \$553,327 between 2011 and 2015. Maintenance costs will include ongoing server capacity and platform maintenance at \$22,000 per year until 2025. This results in a total present value of \$540,043 (in 2009 dollars). Appendix 7-2 uses this total cost to determine the project's overall cost-benefit ratio.

**Table 7-13: Total Project Costs
Regional Water Data Management Program**

Phase	Cost
<i>Regional Water Data Management Program</i> Capital Costs	\$203,327
Programming of Web-Based Data Platform	\$200,000
Startup of Datasets (assumes startup of 5 discrete datasets at \$10,000-\$50,000 each)	\$150,000
Total Project Costs	\$553,327
<i>Regional Water Data Management Program</i> O&M Costs (On-going Server Capacity and Platform Maintenance)	\$220,000
Total Present Value of Discounted Costs	\$540,043

Note: Please see Appendix 7-2, Table 11 for additional detail on calculation of present value.

2. Water Supply Benefits of Proposed Projects

The following sections provide information about the water supply benefits associated with each proposed project within this *San Diego IRWM Implementation Grant Proposal*. The summary of total project costs is based on Tables 12-15 in DWR's Implementation Grant Proposal Solicitation Package (DWR 2010). Appendix 7-2 contains the complete Tables 12-15 exports for each proposed project.

The projects within this proposal are anticipated to result in significant water supply benefits to the Region. Four projects specifically focus on water supply benefits: *Sustainable Landscapes Program*, *North San Diego County Regional Recycled Water Project*, *North San Diego County Cooperative Demineralization Project*, and *Rural DAC Partnership Project*. While these projects are anticipated to directly result in significant water supply benefits, the remaining projects would also have indirect or complementary benefits to the region's water supply.

Project 1: Sustainable Landscapes Program

The water supply benefits that are anticipated to result from implementation of the *Sustainable Landscapes Program* are summarized below in Table 7-13, and the cost-benefit overview is summarized in Table 7-14. This project would result in monetized water supply benefits associated with avoided water supply purchases. Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2

Table 7-13: Benefits Summary
Sustainable Landscapes Program

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Avoided Water Imports	Monetized	Local, regional, and statewide
Water Supply Reliability	Qualitative	Local, regional, and statewide

Table 7-14: Benefit-Cost Analysis Overview
Sustainable Landscapes Program

	Present Value (\$2009)
Costs – Total Capital and O&M	\$1,157,709
Monetizable Benefits	
Avoided Water Imports	\$140,576
Qualitative Benefits	<u>Qualitative Indicator*</u>
Water Supply Reliability	+

* Magnitude of effect on net benefits:

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If the *Sustainable Landscapes Program* were not implemented, current water use efficiency, water demand, and stormwater runoff would remain at current levels. Additionally, there would be no benefit received from reduced water demand, increased water supply reliability, improved water quality, or other conservation-related benefits.

Water Supply Benefits

The *Sustainable Landscapes Program* would result in water supply benefits associated with avoided water supply purchases and increased water supply reliability. Detailed cost and benefit information associated with the project, including present value calculations, is presented in Appendix 7-2.

Avoided Water Imports

The *Sustainable Landscapes Program* is anticipated to include sustainable retrofits that will increase water use efficiency and reduce water demand within the San Diego region. Current water supplies within the San Diego Region are largely comprised of imported water, so by reducing water demand, the project would indirectly reduce purchases of imported water supplies. Total water savings that would be gained from implementation of the project are proportional to the number of sites for which the project would be implemented. As such, water savings resulting from the project are anticipated to be approximately 0.08 AF per participant. This project assumed water savings of:

- 4 AF based on 50 participants in 2012,
- 8 AF based on 100 participants in 2013, and
- 18 AFY based on 224 participants from 2014 to 2022.

In total, from 2012 to 2022, the *Sustainable Landscapes Program* would potentially result in 174 AF of water savings. These water savings were monetized using the SDCWA treated water rates over the ten-year lifetime of the project, which was calculated at a total value of \$140,576.

**Table 7-15: Avoided Imported Water Costs
*Sustainable Landscapes Program***

	Units	Unit Cost	Years	Total Cost
Avoided Imported Water Costs	174 AF	\$1,111-\$1,488	11	\$232,685
Total Avoided Costs after Discounting				\$140,576

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 12 Annual Water Supply Benefits

Water Supply Reliability

The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even in times of drought or other constraints on source water availability. The *Sustainable Landscapes Program* would reduce regional water demand by 174 AF, which reduces the demand for imported water supplies.

Although interest in water supply reliability is increasing, only a few studies have directly attempted to quantify its value. The results from these studies indicate that residential and industrial (i.e., urban) customers seem to value supply reliability quite highly. Stated preference studies find that the annual value of reliability ranged from \$93 to \$489 per household (updated to 2009 dollars) for total reliability (i.e., a 0% probability of their water supply being interrupted in times of drought).²

The challenge for use of these values to determine a value of the project is recognizing how to reasonably interpret these survey-based household monetary values. The values noted above reflect a willingness-to-pay to ensure complete reliability (zero drought-related use restrictions in the future), whereas the *Sustainable Landscapes Program* would increase overall reliability, but would not guarantee 100% reliability. Thus, the dollar values from the studies will probably overstate the reliability value provided by the project.

Reducing the demand for SDCWA imported water would also reduce the demand for the sources of SDCWA imported water, State Water Project (SWP) and Colorado River Aqueduct (CRA) supplies. Reducing the demand of these statewide water resources would benefit California residents and state and local government agencies involved in water management in preparing for drought years by reducing uncertainty about demand for water supplies. SWP and CRA water users will benefit from increased supply reliability, including but not limited to other Southern California municipal water users, Central Valley agricultural, municipal, and industrial water users, and Imperial Valley agricultural water users.

² San Diego County Water Authority on behalf of the San Diego Regional Water Management Group. 2008. *San Diego Integrated Regional Water Management Grant Application, IRWM Implementation Grant, Round 2, Step 2 Program*.

Studies have shown municipal water users throughout California are willing to pay in order to avoid water shortages and reduce water scarcity. Jenkins, Lund, and Howitt (2001) estimated that San Diego County area residents would be willing to pay between \$5 and \$10 (constant \$1995) per person on average (at projected 2020 population levels) to avoid costs associated with water scarcity.³ Expressed in real 2009 dollar values⁴, these willingness-to-pay estimates range from \$8 to \$15 per person at projected 2020 population levels. Project specific benefits are not monetized herein.

Distribution of Project Benefits and Identification of Beneficiaries

Project beneficiaries are summarized in Table 7-16. The *Sustainable Landscapes Program* would potentially reduce local water demand and allow SDCWA to reduce its water imports from the Metropolitan Water District of Southern California (MWD) and the Imperial Irrigation District (IID), who supply SWP and CRA water to San Diego. Use values associated with incremental water supplies would accrue to SWP and IID users. In the case of increased water for agriculture, benefits would be measured as the marginal value of production, less the marginal cost of additional units of available SWP and IID water available at the farm gate.

Increased water use efficiency would reduce demand for water within the region. As a result, the project would increase water supply reliability in times of drought. California government agencies could more effectively manage future statewide droughts because the San Diego region has created a local water supply from recycled water and reduced its demand for SWP water. California citizens also benefit as water rationing (in drought years) will be less likely, and they are incrementally less likely to incur water scarcity costs.

Table 7-16: Project Beneficiaries Summary
Sustainable Landscapes Program

Local	Regional	Statewide
Local water agencies and water users	MWD, IID, and regional water users	California water regulatory and management agencies, and residents

Project Benefits Timeline Description

This project would provide water supply benefits beginning in 2012 and continuing through the 10-year lifetime of the project.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with project construction will be mitigated through the CEQA compliance process. No long-term adverse effects are expected as a result of the proposed project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of this project are summarized below in Table 7-17. Projected savings through the reduction of local water demand represent best estimates based on the latest available data. Actual water savings will vary.

³ Jenkins, Lund, and Howitt (2001) use programming methods to measure the per capita value of urban water scarcity by Detailed Analysis Unit (DAU) throughout California at projected population levels in the year 2020.

⁴ Consumer Price Index for all urban consumers in the San Diego MSA.

**Table 7-17: Omissions, Biases, and Uncertainties and their Effect on the Project
*Sustainable Landscapes Program***

Benefit or Cost Category	Likely Impact on Net Benefits***	Comment
Avoided Water Imports		
• Water Rate Forecasting	+/-	Margin of error implicit in forecasting.
• Climate	+	The projections also are driven by “normal year” expectations, whereas dry year conditions will add additional cost pressure, and may move some of the imported water to higher cost Tier 2 levels.
• Regulatory / Legal	+	Regulatory/legal issues combine to make it more likely than not that the future availability of MWD-provided imported waters will be increasingly constrained, and that costs will escalate at rates higher than experienced in the recent past.
• Increased Water Demands	+	Other SWP users may increase their demand and may result in higher rates (holding supply constant).
• Program Participation	+/-	The number of actual participants in the retrofit incentives or other proposed programs is uncertain.
Water Supply Reliability	+	The monetized value of added reliability is not included in the benefit-cost comparison. If we had added the present value benefit of improved water supply reliability in the overall benefit-cost analysis, it would increase net benefits.

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 2: North San Diego County Regional Recycled Water Project

The benefits that are anticipated to result from implementation of the *North San Diego County Regional Recycled Water Project* are summarized below in Table 7-18, and the cost-benefit overview is summarized in Table 7-19. This project would result in qualitative and monetized water supply benefits, as well as qualitative and quantitative water quality and other benefits (refer to Attachment 8). Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

**Table 7-18: Benefits Summary
*North San Diego County Regional Recycled Water Project***

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Avoided Water Imports	Monetized	Local / Regional
Increased Water Sales Revenue	Qualitative	Local / Regional
Water Supply Reliability (Avoided Water Shortage Costs)	Qualitative	Local / Regional / Statewide

Table 7-19: Benefit-Cost Analysis Overview
North San Diego County Regional Recycled Water Project

	Present Value (\$2009)
Costs – Total Capital and O&M	\$17,199,249
Monetizable Benefits	
Avoided Water Imports	\$61,324,268
Qualitative Benefits	<u>Qualitative Indicator*</u>
Increased Water Sales Revenue	+
Water Supply Reliability	+

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If the *North San Diego County Regional Recycled Water Project* were not implemented, there would be continued use of potable water for municipal and industrial (M&I) purposes that could use recycled water. Additionally, there would be no benefit received from increased water supply reliability or the additional sales revenue associated with recycled water purchases.

Water Supply Benefits

This project would result in the water supply benefits associated with avoided water imports and improved water supply reliability. Detailed cost and benefit information associated with the project, including present value calculations, is in Appendix 7-2.

Avoided Water Imports

The *North San Diego County Regional Recycled Water Project* would facilitate efficient management and coordination among regional entities responsible for reclaimed water production by consolidating North San Diego recycled water projects. The increased efficiency resulting from the proposed project would increase regional recycled water production capacity by 5,000 AFY beginning in 2016. The increase in recycled water production of 5,000 AFY includes the addition 560 AFY of recycled water that would be provided by the *North San Diego County Cooperative Demineralization Project*. As a result, the total value of avoided imported water costs is $5,000 - 560 = 4,440$ AFY. The proposed project would also create the distribution and storage system necessary to distribute the additional recycled water. Increasing regional recycled water production over and above the without project alternative reduces local and regional demand for non-potable water by SDCWA member agencies. The price of SDCWA untreated water is projected to increase from \$1,013 to \$1,724 during 2016-2060, and average \$1,369/AF. Before discounting, annual avoided costs of SDCWA water purchases are expected to average \$6.08 million over the same period for a total present value of \$69,058,860 in 2009 dollars.

Table 7-20: Avoided Imported Water Costs
North San Diego County Regional Recycled Water Project

	Units	Unit Cost	Years	Total Cost
Avoided Imported Water Costs	4,440 AFY	\$1,013-\$1,724	45	\$314,154,726
Total Avoided Costs after Discounting				\$61,324,268

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 12 Annual Water Supply Benefits

Increased Water Sales Revenue

The *North San Diego County Regional Recycled Water Project* would increase recycled water production by 5,000 AFY over the without project alternative. Increased sales revenue from sales and distribution of recycled water would accrue over the without project alternative. This benefit has not been quantified, however, because the entities to which recycled water sales revenue would accrue are unknown, as is

the distribution among them. Assuming SDCWA member agencies will produce their own recycled water supply, net benefits of increased recycled water sales revenue is the value of increased recycled water sales less the cost of production and distribution.

Water Supply Reliability

The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even in times of drought or other constraints on source water availability. The *North San Diego County Regional Recycled Water Project* would increase recycled water production by 5,000 AFY, which reduces the demand for imported SDCWA water supplies.

Although interest in water supply reliability is increasing, only a few studies have directly attempted to quantify its value. The results from these studies do indicate that residential and industrial (i.e., urban) customers seem to value supply reliability quite highly. Stated preference studies find that the annual value of reliability ranged from \$93 to \$489 per household (updated to 2009 dollars) for total reliability (i.e., a 0% probability of their water supply being interrupted in times of drought).⁵

The challenge for use of these values to determine a value of the project is recognizing how to reasonably interpret these survey-based household monetary values. The values noted above reflect a willingness-to-pay to ensure complete reliability (zero drought-related use restrictions in the future), whereas these integrated projects enhance only overall reliability, but do not guarantee 100% reliability. Thus, the dollar values from the studies will probably overstate the reliability value provided by the project. One simple way to roughly adjust for this “whole versus part” problem is to attribute a portion of the total value of reliability to the portion of the project that is solved by the project.

Reducing the demand for water from the State Water Project (SWP) and Colorado River (derived by the demand for SDCWA water) by shifting to local recycled water supplies will benefit California residents and state and local government agencies involved in water management in preparing for drought years by reducing uncertainty about demand for water supplies. SWP and Colorado River water users will benefit from increased supply reliability, including but not limited to other Southern California municipal water users, Central Valley agricultural and M&I water users, and Imperial Valley agricultural water users.

Studies have shown municipal water users throughout California are willing to pay in order to avoid water shortages and reduce water scarcity. Jenkins, Lund, and Howitt (2001) estimated that San Diego County area residents would be willing to pay between \$5 and \$10 (constant \$1995) per person on average (at projected 2020 population levels) to avoid costs associated with water scarcity.⁶ Expressed in real 2009 dollar values⁷, these willingness-to-pay estimates range from \$8 to \$15 per person at projected 2020 population levels. Project specific benefits are not monetized for the purpose of the benefits calculation.

Distribution of Project Benefits and Identification of Beneficiaries

Project beneficiaries are summarized in Table 7-21. As a result of this project, SDCWA member agencies would avoid the cost of purchasing water supplies from SDCWA. In turn, SDCWA may reduce its water imports from MWD and water transfers from IID, and benefits of reduced SDCWA water purchases would accrue to its member agencies. The project would also increase the reliability of the SDCWA member water supply portfolio by shifting away from imports and towards local supply. The project would increase North San Diego County recycled water production capacity by 5,000 AFY, and would create necessary distribution capacity for recycled water delivery throughout the region.

⁵ San Diego County Water Authority on behalf of the San Diego Regional Water Management Group. 2008. *San Diego Integrated Regional Water Management Grant Application, IRWM Implementation Grant, Round 2, Step 2 Program*.

⁶ Jenkins, Lund, and Howitt (2001) use programming methods to measure the per capita value of urban water scarcity by Detailed Analysis Unit (DAU) throughout California at projected population levels in the year 2020.

⁷ Consumer Price Index for all urban consumers in the San Diego MSA.

This project would potentially allow SDCWA to reduce its water imports from MWD and IID as it faces reduced demand for water due to increased local production and use of recycled water. Use values associated with incremental water supplies would accrue to SWP and IID users. In the case of increased water for agriculture, benefits would be measured as the marginal value of production, less the marginal cost of additional units of available SWP and IID water available at the farm gate.

Increased production and usage of reclaimed water would reduce demand for non-potable, and possibly potable, water within the region. As a result, the *North San Diego County Regional Recycled Water Project* would increase water supply reliability in times of drought. California government agencies could more effectively manage future statewide droughts because the San Diego region has created a local water supply from recycled water and reduced its demand for SWP water. California citizens also benefit as water rationing (in drought years) will be less likely, and they are incrementally less likely to incur water scarcity costs.

Table 7-21: Project Beneficiaries Summary
North San Diego County Regional Recycled Water Project

Local	Regional	Statewide
Project partners and residents/rate payers	SDCWA member agencies, SWP customers, Imperial Valley agriculture, and residents	California water regulatory and management agencies, and residents of California

Project Benefits Timeline Description

The *North San Diego County Regional Recycled Water Project* would provide water supply benefits beginning in 2016 and continuing in excess of the 50-year project lifetime.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with project construction will be mitigated through the CEQA compliance process. No long-term adverse effects are expected as a result of the proposed project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of this project are summarized below in Table 7-22. Projected savings through the increased use of recycled water represent best estimates based on the latest available data. Actual water savings will vary.

Table 7-22: Omissions, Biases, and Uncertainties and their Effect on the Project
North San Diego County Regional Recycled Water Project

Benefit or Cost Category	Likely Impact on Net Benefits	Comment
Avoided Water Imports <ul style="list-style-type: none"> Climate 	+/-	Projected SDCWA real water prices are based on projected MWD prices. Projected water rates are based on “normal year” expectations, whereas dry year conditions will add additional cost pressures (and may move some water to higher cost Tier 2 levels). Increasing concerns about climate change, specifically with respect to global warming, may increase evaporation and evapotranspiration resulting in reduced water supplies and putting upward pressure on water prices (holding demand constant). The future price of MWD, and therefore SDCWA water, may be understated and thus net benefits would likely increase.
<ul style="list-style-type: none"> Regulatory / Legal 	+	Recent regulatory/legal issues, specifically those surrounding the Bay-Delta ecosystem with respect to operation of the SWP, increase the likelihood that SDCWA surface water supplies from MWD will be reduced in the future, even at existing demand levels. As a result, prices may increase at higher rates than experienced in the recent past.
<ul style="list-style-type: none"> Increased Water Demands 	+/-	SWP and CRA water users may increase demand, which may result in higher rates (holding supply constant). Population projections are forecasted based on a host of assumptions, that when violated, will result in uncertainty about actual future demand for California water.
<ul style="list-style-type: none"> Untreated SDCWA Water Rate 	+	Net benefits of avoided water supply purchases are computed using the untreated SDCWA water rate as the cost of avoided water supply. If demand for non-potable water exceeds supply, potable water may be used to satisfy excess demand in the without project alternative, and the treated SDCWA water rate would be more appropriate for the cost of avoided water.
<ul style="list-style-type: none"> Higher Cost of Recycled Water 	+/-	According to SEJPA data, SDCWA members pay more for recycled water than for untreated water from SDCWA. As a result, the project may increase the marginal cost of water for SDCWA members purchasing recycled water and the avoided water supply cost net benefits are biased upward. To the extent SDCWA members bear the cost of increasing recycled water supply and produce it internally, the cost of recycled water is lower than when purchased from an outside entity (such as SEJPA).
Water Supply Reliability	+	The monetized value of added reliability is not included in the benefit-cost comparison. Adding the present value benefit of improved water supply reliability into the overall benefit-cost analysis would increase net benefits.

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive) ; - (moderate negative); -- (significant negative)

Project 3: North San Diego County Cooperative Demineralization Project

The *North San Diego County Cooperative Demineralization Project* would result in water supply benefits associated with avoided water supply purchases, increased water sales revenue, and avoided water shortage costs. These water supply benefits are summarized below in Table 7-23. The magnitude of benefits, which were monetized when possible, is summarized in Table 7-24. Detailed cost and benefit information associated with implementation of this project, including present value calculations, is available in Appendix 7-2.

Table 7-23: Benefits Summary
North San Diego County Cooperative Demineralization Project

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Avoided Water Imports (Demineralization)	Monetized	Local / Regional
Avoided Water Imports (Desalination)	Physical Quantification	Local / Regional
Increased Water Sales Revenue	Qualitative	Local / Regional
Improved Water Supply Reliability (Avoided Water Shortage Costs)	Qualitative	Local / Regional / Statewide

Table 7-24: Benefit-Cost Analysis Overview
North San Diego County Cooperative Demineralization Project

	Present Value (\$2009)
Costs – Total Capital and O&M	\$27,802,301
Monetizable Benefits	
Avoided Water Imports (Demineralization)	\$55,645,552
Qualitative Benefits	<u>Qualitative Indicator*</u>
Avoided Water Imports (Desalination)	+
Increased Water Sales Revenue	+
Improved Water Supply Reliability	+

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If the *North San Diego County Cooperative Demineralization Project* were not implemented, there would be potential shut down of the San Elijo Water Reclamation Facility (SEWRF) due to regulatory non-compliance with the facility’s Master Recycled Water Permit, which prohibits the distribution of effluent that does not comply with certain numeric values, including total dissolved solids (TDS). If the facility were shut down, approximately 1,200 AFY of reclaimed water currently produced at the SEWRF would no longer be available to local water purveyors: Santa Fe Irrigation District (SFID), San Dieguito Water District (SDWD), and the City of Del Mar. These purveyors currently use or sell reclaimed water to customers including golf courses, school districts, homeowners associations, and others.⁸ At present, water that is not supplied by the SEWRF is largely conveyed to customers throughout the San Diego region by the San Diego County Water Authority (SDCWA). SDCWA’s water supply is approximately 70 to 90 percent imported water, which is supplied to the region from either the Metropolitan Water District of Southern California (MWD) or the Imperial Irrigation District (IID).

⁸ San Elijo Joint Powers Authority Website, “Water Reclamation”, Available at: http://www.sejpa.org/index.php?parent_id=26&page_id=29 [Accessed December 2010].

Water Supply Benefits

This project would result in benefits associated with increasing the reclaimed water production capacity at the SEWRF by 560 AFY beginning in 2012. These water supply benefits include: avoided costs of imported water, increased water sales revenue, and increased water supply reliability.

Avoided Water Imports

Demineralization

The *North San Diego County Cooperative Demineralization Project* will increase the recycled water production capacity at the SEWRF by 560 AFY beginning in 2012. This increase in regional recycled water production would reduce local and regional demand for non-potable water by SDCWA member agencies including SFID, SDWD, City of Del Mar, and others currently purchasing reclaimed water from the SEJPA.

Implementation of the *North San Diego County Cooperative Demineralization Project* allows SEJPA to produce recycled water with TDS levels that meet requirements in the *Water Quality Control Plan for the San Diego Basin 9* (Basin Plan). As such, the proposed project prevents the SEWRF from closure under a 'cease and desist' order issued by the San Diego RWQCB.⁹ If the entire SEWRF recycled water production capacity is utilized, which would require development of recycled water distribution capacity and an increase in recycled water demand by SDCWA member agencies, then the project would reduce purchases of SDCWA-supplied water by 3,340 AFY. Increasing local water supplies to SDCWA member agencies would reduce the local and regional demand for imported water, because the current SDCWA water supply is comprised of approximately 70 to 90 percent imported water.

The price of SDCWA untreated water is projected to increase from \$875 to \$1,724 per acre foot from 2012 to 2060, and average \$1,300 per acre foot. Given these values for untreated water, and assuming that the entire SEWRF recycled water capacity is utilized, the annual avoided costs of imported water purchases are expected to average \$4.34 million (before discounting) over the Project's lifetime (from 2012 to 2060). After discounting, the total present value associated with this water supply benefit is \$55,645,552.

Table 7-25: Avoided Imported Water Costs
North San Diego County Cooperative Demineralization Project

	Units	Unit Cost	Years	Total Cost
Avoided Imported Water Costs	3,340 AFY	\$875-\$1,724	49	\$222,228,598
Total Avoided Costs after Discounting				\$55,645,552

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 12 Annual Water Supply Benefits

Desalination

The *North San Diego County Cooperative Demineralization Project* will also include a feasibility study for constructing and operating a desalination plant. If this plant were to be constructed, it would potentially increase water supply for SDCWA member agencies by 1,122 AFY. Utilizing the aforementioned SDCWA untreated water costs, the increase in local water supply that would be provided by this project with respect to desalination would generate \$1.43 million (before discounting) in annual avoided imported water purchases. This benefit has not been monetized as part of the cost-benefit analysis for this project because initial and O&M costs of the potential desalination plant are not currently available.

Increased Water Sales Revenue

The *North San Diego County Cooperative Demineralization Project* will increase recycled water production capacity at the SEWRF by 3,340 AFY over the without project alternative. This increased

⁹ California Regional Water Quality Control Board, San Diego Region. July 7, 2010. Review of Monitoring Report for Order No. R9-2000-0010. Letter to Michael Thornton, General Manager, San Elijo Joint Powers Authority.

water recycled production would increase water sales revenue to the SEJPA. This benefit has not been monetized because the revenue generated is dependent upon sales agreements that have not yet been developed.

Water Supply Reliability

The additional recycled water capacity that would be provided by the *North San Diego County Cooperative Demineralization Project* would also reduce TDS levels in the recycled water delivered by the SEWRF by 300 mg/L compared to current levels. Reducing TDS by this amount would ensure that SEWRF operates in compliance with its Master Recycled Water Permit, which prohibits the distribution of effluent that exceeds the annual average for TDS of 1200 mg/L or the maximum day values for TDS of 1300 mg/L. By ensuring that the SEWRF is in compliance with its required permit, the project would protect the beneficial use that is provided by the existing 2,780 AFY reclaimed water capacity at the SEWRF.

The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even during times of drought or other water supply availability constraints. The existing SEWRF provides a local water source that helps to sustain local water supplies through droughts and through reductions in imported water allocations. This local water source helps to supplement the existing SDCWA water supply, which is primarily comprised of imported water from the State Water Project (SWP) and Colorado River Aqueduct (CRA). Due to SEWRF's role in supplementing SDCWA water supplies, the SEWRF also reduces the local and regional demand for imported water from the SWP and CRA. Reducing demands for statewide water supplies benefits all California residents and state and local government agencies involved in water management, by helping them prepare for drought years by reducing uncertainty about demand for water supplies. By assisting the SEWRF in meeting requirements of its Master Recycled Water Permit, the project would provide benefits associated with maintaining all of the aforementioned benefits that are provided by the SEWRF.

By increasing the reliability of the SEWRF, the project would also benefit SWP and CRA water users, including but not limited to other Southern California municipal water users, Central Valley agricultural, municipal, and industrial water users, and Imperial Valley agricultural water users, by increasing their water supply reliability. Studies have shown municipal water users throughout California are willing to pay a certain amount of money in order to avoid water shortages and reduce water scarcity.¹⁰ Jenkins, Lund, and Howitt (2001) estimated that San Diego County area residents would be willing to pay between \$5 and \$10 (constant \$1995) per person on average (at projected 2020 population levels) to avoid costs associated with water scarcity. Expressed in real 2009 dollar values, these willingness-to-pay estimates range from \$8 to \$15 per person at projected 2020 population levels.¹¹ These benefits were not monetized for the purpose of the benefits calculation for this project.

Distribution of Project Benefits and Identification of Beneficiaries

Table 7-26 summarizes the *North San Diego County Cooperative Demineralization Project's* beneficiaries, which include local, regional, and statewide beneficiaries. Benefits associated with increased water sales revenue would be local in that any net increase in water sales along the value chain from SEJPA to the retail customer would accrue as a benefit.

Regional beneficiaries would include SWP contractors, Imperial Valley agriculture water users, and residents within the San Diego region. As stated in the benefits analysis, increasing and protecting reclaimed water production capacity at SEWRF reduces demand for SDCWA water by SDCWA member

¹⁰ Jenkins, Lund, and Howitt (2001) use programming methods to measure the per capita value of urban water scarcity by Detailed Analysis Unit (DAU) throughout California at projected population levels in the year 2020. The results show estimated scarcity values ranging between \$5 and \$20 per person in the San Diego Region DAUs (in constant \$1995). Scarcity values are measured as lost consumer surplus resulting from changes in quantity of water available for a given willingness-to-pay schedule and depend heavily on the estimated price elasticity of demand for urban water supplies.

¹¹ These values are based on the Consumer Price Index for all urban consumers in the San Diego Metropolitan Statistical Area.

agencies SFID, SDWD, City of Del Mar, and others. In turn, SDCWA may reduce its water imports from suppliers MWD and IID. Use values associated with incremental water supplies can accrue to all SWP and CRA contractors. In the case of increased water for agriculture, benefits would be measured as the marginal value of production, less the marginal cost of additional units of available SWP and IID water available at the farm gate. In addition, increasing water supplies available from the SEWRF would allow SDCWA member agencies to avoid costs associated with purchasing water supplies from SDCWA. In turn, SDCWA may reduce its water imports from MWD and IID, which would provide benefits to all SDCWA member agencies. This project would also benefit the *North San Diego County Regional Recycled Water Project* by creating an additional 560 AFY of recycled water supply that would be beneficially used by that project.

The project would also have statewide beneficiaries, because the project would increase water supply reliability in times of drought. If this benefit were to occur, California government agencies could more effectively manage future statewide droughts because the San Diego region will have created a local water supply from recycled water and reduced its demand for imported water. California citizens also benefit as water rationing (in drought years) will be less likely, and they are incrementally less likely to incur water scarcity costs.

Table 7-26: Project Beneficiaries Summary
North San Diego County Cooperative Demineralization Project

Local	Regional	Statewide
SEJPA and SDCWA member agencies; project partners	SWP contractors, IID customers, SDCWA member agencies, residents, and project partners	California water regulatory and management agencies, and residents

Project Benefits Timeline Description

Water supply benefits from this project associated with avoiding water imports due to increasing reclaimed water and due to increasing desalinated water would begin in 2012 and span for at least the 48-year project lifetime (through 2060).

Potential Adverse Effects from the Project

Any potential short-term impacts associated with this project will be addressed and mitigated during the CEQA compliance process. No long-term adverse effects are expected as a result of this project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of the *North San Diego County Cooperative Demineralization Project* are summarized below in Table 7-27. Uncertainties regarding the benefits associated with the avoided cost of imported water are due to uncertainties regarding climate, regulatory/legal issues, water demands, SEWRF distributional capacity, untreated SDCWA water rates, demand for SEWRF recycled water, and the cost of recycled water. In addition, uncertainties regarding water supply reliability would generate uncertainties regarding the benefits that this Project would provide regarding water supply reliability.

Table 7-27: Omissions, Biases, and Uncertainties and their Effect on the Project
North San Diego County Cooperative Demineralization Project

Benefit or Cost Category	Likely Impact on Net Benefits*	Comment
Avoided Water Imports <ul style="list-style-type: none"> Climate 	+/-	Projected SDCWA real water prices are based on projected MWD prices. Projected water rates are based on “normal year” expectations, whereas dry year conditions will add additional cost pressures (and may move some water to higher cost Tier 2 levels). Increasing concerns about climate change, which may increase evaporation and transpiration resulting in reduced water supplies and putting upward pressure on water prices (holding demand constant). The future price of MWD, and therefore SDCWA, water may be understated and thus net benefits associated with this project would likely increase.
<ul style="list-style-type: none"> Regulatory / Legal 	+	Recent regulatory/legal issues, specifically those surrounding the Bay-Delta ecosystem with respect to operation of the SWP, increase the likelihood that SDCWA surface water supplies from MWD and IID will be reduced in the future, even at existing demand levels. As a result, prices may increase at higher rates than experienced in the recent past. The future price of MWD, and therefore SDCWA, water may be understated and thus net benefits associated with this project would likely increase.
<ul style="list-style-type: none"> Increased Water Demands 	+/-	SWP and CRA water users may increase demand, which may result in higher rates (holding supply constant). Population projections are forecasted based on a host of assumptions, that when violated, will result in uncertainty about actual future demand for California water.
<ul style="list-style-type: none"> SEWRF Distribution Capacity 	--	Uncertainty exists as to when distributional capacity at the SEWRF will be expanded to fully utilize increased recycled water production resulting from the project. This uncertainty could decrease net benefits, because current calculations assume immediate use of the entire incremental recycled water capacity resulting from the project.
<ul style="list-style-type: none"> Untreated SDCWA Water Rate 	+	Net benefits of avoided water imports are computed using the untreated SDCWA water rate as the cost of avoided water supply. If demand for non-potable water exceeds supply, potable water may be used to satisfy excess demand in the without project alternative, and the treated SDCWA water rate would be more appropriate for the cost of avoided water.
<ul style="list-style-type: none"> Demand for SEWRF Recycled Water 	+/-	The SEWRF currently distributes 1,200 AFY of recycled water to SDCWA members and others in the San Diego area. This amounts to less than 50% of the existing 2,780 AFY recycled water capacity. Net benefits computations assume demand for recycled water will increase by 2,140 AFY by 2012. Uncertainty exists, but the IRWM Plan has set specific mandatory levels of growth in recycled water use from 14,380 AFY to 47,580 AFY.
<ul style="list-style-type: none"> Higher Cost of Recycled Water 	--	SDCWA members pay more for recycled water from SEJPA than for untreated water from SDCWA. As a result, the project may increase the marginal cost of water for SDCWA members purchasing recycled water from SEWRF, which would mean that the avoided water supply cost net benefits of the project are overestimated.
Water Supply Reliability	+	The monetized value of added reliability is not included in the benefit-cost comparison. Adding the present value benefit of improved water supply reliability into the overall benefit-cost analysis would increase net benefits.

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 4: Rural Disadvantaged Community (DAC) Partnership Project

The benefits that are anticipated to result from implementation of the *Rural Disadvantaged Community (DAC) Partnership Project* are summarized below in Table 7-28, and the cost-benefit overview is summarized in Table 7-29. This project would result in qualitative and monetized water supply benefits, as well as qualitative and quantitative water quality and other benefits (refer to Attachment 8). Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

**Table 7-28: Benefits Summary
*Rural DAC Partnership Project***

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Avoided Water Supply Purchases	Monetized	Local
Water Supply Reliability	Qualitative	Local, regional, and statewide

**Table 7-29: Benefit-Cost Analysis Overview
*Rural DAC Partnership Project***

	Present Value (\$2009)
Costs – Total Capital and O&M	\$707,463
Monetizable Benefits	
Avoided Water Supply Purchases	\$172,718
Qualitative Benefits	<u>Qualitative Indicator*</u>
Water Supply Reliability	+

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If this project were not implemented, the Rural Community Assistance Corporation (RCAC) would not have funding for rural disadvantaged communities (DAC) projects that address critical water supply and wastewater needs of rural DACs. Therefore, without this project, the identified benefits to water supply, water quality, and other water-related factors would not be realized.

Water Supply Benefits

This project would result in the water supply benefits associated with avoided water supply purchases. Detailed cost and benefit information associated with the Project, including present value calculations, is presented in Appendix 7-2.

Avoided Water Supply Purchases

The *Rural DAC Partnership Project* would potentially involve multiple small projects that address critical infrastructure improvements for rural DACs. For purposes of this analysis, two potential critical water resources projects were selected as proxies by which to estimate the potential benefits that would be a result of implementation of this project (*Sample Project 1: MGB Well Rehab and Treatment Plan Renovation* is discussed below).

Sample Project 1: MGB Well Rehab and Treatment Plan Renovation would modify a sole source well for increased production, which would replace iron and magnesium treatments for well water because these previous treatment mechanisms have previously been unsuccessful. Further, in this particular well, the water source does not meet existing demands, and therefore requires community rationing of the water supply. Because there is an inadequate water supply and inadequate groundwater quality, community members must purchase water (mainly bottled water) to supplement their water supply.

Sample Project 1: MGB Well Rehab and Treatment Plan Renovation would provide monetary benefits by reducing the need for residents to purchase alternative water supplies. For purposes of this analysis, the local resident population was assumed to be 50 in the project area, and it was assumed that on average half of the residents (25 people) purchase bottled water either to avoid consuming contaminated water or due to lack of available water. In addition, it was assumed that each person requires one gallon per day of drinking water, or 365 gallons per year. The cost of a gallon of water is estimated to be between \$1.50 and \$2.00, for an average of \$1.75 per gallon.

In total, the *Rural DAC Partnership Project* would result in water supply benefits during the lifetime of the project (from 2011 to 2030) and would total \$172,718 over that lifetime.

**Table 7-30: Avoided Water Supply Purchases
*Rural DAC Partnership Project***

	Affected Residents	Gallons per person (per year)	Alternative Water Supply Costs (per gallon)	Years	Total Costs
Avoided Water Supply Purchases	25	365	\$1.75	20	\$319,375
Total Avoided Water Supply Purchases after Discounting					\$172,718

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 12 Annual Water Supply Benefits

Water Supply Reliability

The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even in times of drought or other constraints on source water availability. The *Rural DAC Partnership Project* provides for imported water supply reliability through improving the availability of local water.

Although interest in water supply reliability is increasing, only a few studies have directly attempted to quantify its value. The results from these studies do indicate that residential and industrial (i.e., urban) customers seem to value supply reliability quite highly. Studies have shown municipal water users throughout California are willing to pay a certain amount of money in order to avoid water shortages and reduce water scarcity.¹² Jenkins, Lund, and Howitt (2001) estimated that San Diego County area residents would be willing to pay between \$5 and \$20 (constant \$1995) per person on average (at projected 2020 population levels) to avoid costs associated with water scarcity. Expressed in real 2009 dollar values, these willingness-to-pay estimates range from \$8 to \$15 per person at projected 2020 population levels.¹³ Due to the complexity and uncertainty regarding the monetary benefits that would result from increasing water supply reliability, these benefits were not monetized.

Distribution of Project Benefits and Identification of Beneficiaries

The *Rural DAC Partnership Project* would improve the local water supply reliability for small rural systems within the project area, thereby benefitting local residents.

**Table 7-31: Project Beneficiaries Summary
*Rural DAC Partnership Project***

Local	Regional	Statewide
Local residents	<i>Not Applicable</i>	<i>Not Applicable</i>

¹² Jenkins, Lund, and Howitt (2001) use programming methods to measure the per capita value of urban water scarcity by Detailed Analysis Unit (DAU). Scarcity values are measured as lost consumer surplus resulting from changes in quantity of water available for a given willingness-to-pay schedule and depend heavily on the estimated price elasticity of demand for urban water supplies.

¹³ These values are based on the Consumer Price Index for all urban consumers in the San Diego Metropolitan Statistical Area.

Project Benefits Timeline Description

The *Rural DAC Partnership Project* would provide water supply benefits over a twenty year period beginning in 2011 and ending in 2030.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with project construction will be mitigated through the CEQA compliance process. No long-term adverse effects are expected as a result of the proposed project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of this project are summarized below in Table 7-32. Projected savings through avoiding water supply purchases represent best estimates based on the latest available data. Actual water supply benefits will vary.

Table 7-32: Omissions, Biases, and Uncertainties and their Effect on the Project
Rural DAC Partnership Project

Benefit or Cost Category	Likely Impact on Net Benefits	Comment
Water Supply	+/-	The percentage of residents purchasing all daily drinking water is unknown. The cost of bottled drinking water is an estimate. Actual prices may be higher or lower than estimated.

* Magnitude of effect on net benefits:

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 5: Lake Hodges Water Quality and Quagga Mitigation Measures

The benefits that are anticipated to result from implementation of the *Lake Hodges Water Quality and Quagga Mitigation Measures* project are summarized below in Table 7-33, and the cost-benefit overview is summarized in Table 7-34. This project would result in monetized water supply benefits, as well as qualitative and monetized water quality and other benefits (refer to Attachment 8). Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

Table 7-33: Benefits Summary
Lake Hodges Water Quality and Quagga Mitigation Measures

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Increased Water Supply Usability	Monetized	Local, Regional, and Statewide
Improved Water Supply Reliability	Qualitative	Local and Regional

Table 7-34: Benefit-Cost Analysis Overview
Lake Hodges Water Quality and Quagga Mitigation Measures

	<u>Present Value (\$2009)</u>
Costs – Total Capital and O&M	\$1,517,868
Monetizable Benefits	
Increased Water Supply Usability	\$41,783,290
Qualitative Benefits	<u>Qualitative Indicator*</u>
Improved Water Supply Reliability	+

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If this project were not implemented, there would be continued operation and maintenance costs and associated negative impacts on water supply associated with Quagga infestation. For further information regarding the without project baseline used to determine water quality and other benefits, please refer to Attachment 8.

Water Supply Benefits

This project would result in the water supply benefits water supply benefits associated with improved water supply reliability. Detailed cost and benefit information associated with the project, including present value calculations, is presented in Appendix 7-2.

Increased Water Supply Usability

The *Lake Hodges Water Quality and Quagga Mitigation Measures* project would increase water supply usability by reducing facility shutdowns at Lake Hodges due to Quagga mussel infestation. Such shutdowns render water supplies unusable and force SDCWA member agencies to purchase imported water instead of using local water. The project would avoid facility shutdown and result in an increase in usable water supplies from 9,000 AFY to 11,400 AFY, an increase of 2,400 AFY. As a result of this potential local annual yield, less imported water would be purchased. Additionally, the reduced shutdown would improve the facility’s ability to pump water out of the reservoir during wet weather events, thus reducing the likelihood of a loss of water over the dam spillway. The value of this benefit would start in 2011 and continue until 2060.

As shown in Table 7-35, the monetized benefit is based on SDCWA untreated water rates and would represent a total present value of \$41,783,290 (in 2009 dollars).

Table 7-35: Avoided Imported Water Costs
Lake Hodges Water Quality and Quagga Mitigation Measures

	Units	Unit Cost	Years	Total Cost
Avoided Imported Water Costs	2,400 AFY	\$842-\$1,724	50	\$161,705,964
Total Avoided Costs after Discounting				\$41,783,290

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 12 Annual Water Supply Benefits

Improved Water Supply Reliability

The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even in times of drought or other constraints on source water availability. The *Lake Hodges Water Quality and Quagga Mitigation Measures* project provides for imported water supply reliability through improving the availability of local water.

Although interest in water supply reliability is increasing, only a few studies have directly attempted to quantify its value. The results from these studies do indicate that residential and industrial (i.e., urban) customers seem to value supply reliability quite highly. Stated preference studies find that the annual value of reliability ranged from \$93 to \$489 per household (updated to 2009 dollars) for total reliability (i.e., a 0% probability of their water supply being interrupted in times of drought).¹⁴

The challenge for use of these values to determine a value of the project is recognizing how to reasonably interpret these survey-based household monetary values. The values noted above reflect a willingness-to-pay to ensure complete reliability (zero drought-related use restrictions in the future), whereas the *Lake Hodges Water Quality and Quagga Mitigation Measures* project enhances only overall reliability, but does not guarantee 100% reliability. Thus, the dollar values from the studies will probably

¹⁴ San Diego County Water Authority on behalf of the San Diego Regional Water Management Group. 2008. *San Diego Integrated Regional Water Management Grant Application, IRWM Implementation Grant, Round 2, Step 2 Program*.

overstate the reliability value provided by the project. As such, this assessment does not apply a specific monetized value to overall reliability, but acknowledges the benefits as qualitative.

Distribution of Project Benefits and Identification of Beneficiaries

This project would avoid importing an additional 2,400 AFY of MWD water supplies which would result in lower water rates paid by local ratepayers. The project would also potentially result in water supply benefits to MWD customers by reducing regional water import demands, therefore resulting in increased water supply availability to other MWD customers. Lastly, the project would potentially benefit statewide stakeholders by reducing the demand for imported water exports from the San Francisco San Joaquin Bay-Delta (Bay-Delta). Reducing demands on Bay-Delta water would benefit statewide stakeholders by increasing habitat quality and associated ecosystem conditions provided by the Bay-Delta ecosystem.

Table 7-36: Project Beneficiaries Summary
Lake Hodges Water Quality and Quagga Mitigation Measures

Local	Regional	Statewide
Local water ratepayers	Regional MWD customers	Bay-Delta ecosystem

Project Benefits Timeline Description

This project would provide water supply benefits beginning in 2011 and continuing in excess of the 50-year project lifetime.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with project construction will be mitigated through the CEQA compliance process. No long-term adverse effects are expected as a result of the proposed project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of this project are summarized below in Table 7-37. Projected savings through the reduction of Quagga infestation represent best estimates based on the latest available data. Actual water savings will vary.

Table 7-37: Omissions, Biases, and Uncertainties and their Effect on the Project
Lake Hodges Water Quality and Quagga Mitigation Measures

Benefit or Cost Category	Likely Impact on Net Benefits	Comment
Increased Water Supply Usability		
• Water rate forecast	+/-	Margin of error implicit in forecasting.
• Climate	+	Forecasts also are driven by “normal year” expectations, whereas dry year conditions will add additional cost pressures (and may move some of the imported water to higher cost Tier 2 levels).
• Regulatory/legal	+	Regulatory/ legal issues combine to make it more likely than not that the future availability of MWD-provided imported waters will be increasingly constrained, and that costs will escalate at rates higher than experienced in the recent past.
• Increased water demands	+	Other SWP users may increase their demand and may result in higher rates (holding supply constant).
Improved Water Supply Reliability	+	The monetized value of added reliability is not included in the benefit-cost comparison. If we had added the present value benefit of improved water supply reliability in the overall benefit-cost analysis, it would increase net benefits.

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 6: Implementing Nutrient Management in the Santa Margarita River Watershed

The water supply benefits that are anticipated to result from implementation of the *Implementing Nutrient Management in the Santa Margarita River Watershed* project are summarized below in Table 7-38, and the cost-benefit overview is summarized in Table 7-39. Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

Table 7-38: Benefits Summary
Implementing Nutrient Management in the Santa Margarita River Watershed

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Avoided Water Imports	Monetized	Local

Table 7-39: Benefit-Cost Analysis Overview
Implementing Nutrient Management in the Santa Margarita River Watershed

	Present Value (\$2009)
Costs – Total Capital and O&M	\$1,534,082
Monetizable Benefits	
Avoided Water Imports	\$40,866,899
Qualitative Benefits	<u>Qualitative Indicator*</u>
N/A	N/A

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If this project were not implemented, the Rancho California Water District (RCWD) would continue to purchase an average of 4,000 acre feet per year (AFY) of water from the Metropolitan Water District of Southern California (MWD) for delivery to the Santa Margarita River in order to augment flows in accordance with an agreement between RCWD and the Santa Margarita Watermaster. For further information regarding the without project baseline used to determine water quality and other benefits, please refer to Attachment 8.

Water Supply Benefits

This project would result in the water supply benefits associated with water cost savings. Detailed cost and benefit information associated with the Project, including present value calculations, is presented in Appendix 7-2.

Avoided Water Imports

The *Implementing Nutrient Management in the Santa Margarita River Watershed* project could result in avoided water imports by RCWD if found that they could use recycled water instead of imported raw water to augment flows in the Santa Margarita River. The proposed project would study and refine water quality objectives for the Santa Margarita River watershed, which could possibly find that a broader range of water sources, such as recycled water, may be naturally sustained to the Santa Margarita River.

RCWD currently delivers an average of 4,000 AFY of untreated Tier 2 water supplies from MWD, and these costs are anticipated to increase over time (refer to Table 7-1-2 in Appendix 7-1). If recycled water could be used to meet RCWD's delivery requirements, the cost for this water would be lower than the cost of using untreated Tier 2 supplies.

The cost for production of recycled water by RCWD was assumed to be \$525/AF, and this cost was assumed to remain constant over the time for which water supply benefits would extend (2016 to 2045). The cost for recycled water takes into account current costs of recycled water, which are \$225/AF, and then assumes that the recycled water would need to be desalinated to meet the TDS standard of 500

ppm. This desalination effort would cost approximately \$300/AF, thereby rendering the cost of recycled water at approximately \$525/AF.

The price of MWD Tier 2 water is projected to increase from \$1,118 to \$2,662 per acre foot from 2016 to 2045, and average \$1,791 per acre foot. Given these values for untreated water, and assuming that the project would avoid purchasing 4,000 AFY of Tier 2 water supplies from MWD from 2016 to 2045, the annual avoided costs of imported water purchases are expected to average \$7.2 million (before discounting).

After discounting, and taking into account the costs associated with recycled water, the total present value associated with this water supply benefit is \$40,866,899.

Table 7-40: Avoided Water Import Costs
Implementing Nutrient Management in the Santa Margarita River Watershed

	Units	Unit Cost	Years	Total Cost
Avoided Water Import Costs	4,000 AFY	\$1,118 - 2,662	30	\$214,893,698
Costs of Recycled Water	4,000 AFY	\$525/AF	30	-\$63,000,000
Total Avoided Water Import Costs				\$151,893,698
Total Avoided Water Import Costs after Discounting				\$40,866,899

Notes: For further information regarding how these numbers were calculated, please refer to Appendix 7-2, Table 14 Annual Other Water Supply Benefits

Distribution of Project Benefits and Identification of Beneficiaries

Project beneficiaries include local, regional, and statewide beneficiaries, and are summarized in Table 7-41 below. As a result of this project, RCWD would potentially decrease their imported water costs for supplies delivered to the Santa Margarita River. These cost savings could potentially benefit local RCWD water ratepayers served by decreasing local water costs. The project would also potentially result in water supply benefits to MWD customers by reducing regional water import demands, therefore resulting in increased water supply availability to other MWD customers. Lastly, the project would potentially benefit statewide stakeholders by reducing the demand for imported water exports from the San Francisco San Joaquin Bay-Delta (Bay-Delta). Reducing demands on Bay-Delta water would benefit statewide stakeholders by increasing habitat quality and associated ecosystem conditions provided by the Bay-Delta ecosystem.

Table 7-41: Project Beneficiaries Summary
Implementing Nutrient Management in the Santa Margarita River Watershed

Local	Regional	Statewide
Local water ratepayers	Regional MWD customers	Bay-Delta ecosystem

Project Benefits Timeline Description

This project would provide water supply benefits beginning in 2016 and continuing through 2045.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with project construction will be mitigated through the California Environmental Quality Act compliance process. No long-term adverse effects are expected as a result of the proposed project.

Uncertainty of Benefits

The potential water supply benefit would only occur after approval by the San Diego RWQCB to use recycled water instead of imported raw water to augment flows in the Santa Margarita River. This potential benefit could only be realized if the recycled water met the developed site-specific water quality objectives for nutrients in the Santa Margarita River (Phase II).

**Table 7-42: Omissions, Biases, and Uncertainties and their Effect on the Project
Implementing Nutrient Management in the Santa Margarita River Watershed**

Benefit or Cost Category	Likely Impact on Net Benefits	Comment
Avoided Water Imports	--	This potential benefit could only be realized if the recycled water met the developed site-specific water quality objectives for nutrients in Santa Margarita River (Phase II).

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 7: Bannock Avenue Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection

The benefits that are anticipated to result from implementation of the *Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection* project are summarized below in Table 7-43, and the cost-benefit overview is summarized in Table 7-44. This project would not result in quantifiable and/or monetized water supply benefits. Detailed cost and benefit information associated with the Project, including present value calculations, is provided in Appendix 7-2.

**Table 7-43: Benefits Summary
Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection**

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>

**Table 7-44: Benefit-Cost Analysis Overview
Bannock Ave Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection**

	Present Value (\$2009)
Costs – Total Capital and O&M	\$4,168,512
Monetizable Benefits	
N/A	N/A
Qualitative Benefits	<u>Qualitative Indicator*</u>
N/A	N/A

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Water Supply Benefits

There are no expected water supply benefits associated with this project.

Project 8: Pilot Concrete Channel Infiltration Project

The benefits that are anticipated to result from implementation of the *Pilot Concrete Channel Infiltration Project* are summarized below in Table 7-45, and the cost-benefit overview is summarized in Table 7-46. This project would not result in quantifiable and/or monetized water supply benefits, but would generate quantifiable and monetized benefits to water quality (refer to Attachment 8). Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

Table 7-45: Benefits Summary
Pilot Concrete Channel Infiltration Project

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
Groundwater Recharge	Qualitative	Regional

Table 7-46: Benefit-Cost Analysis Overview
Pilot Concrete Channel Infiltration Project

	<u>Present Value (\$2009)</u>
Costs – Total Capital and O&M	\$281,294
Monetizable Benefits	
N/A	N/A
Qualitative Benefits	<u>Qualitative Indicator*</u>
Groundwater Recharge	+/-

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

This project would not result in quantifiable and/or monetized water supply benefits, therefore there is no without project baseline for this project with respect to water supply benefits. For further information regarding the without project baseline used to determine water quality and other benefits, please refer to Attachment 8.

Water Supply Benefits

This project would result in potential future water supply benefits which have not been quantified and/or monetized. Detailed cost and benefit information associated with the project, including present value calculations, is provided in Appendix 7-2.

Groundwater Recharge

The *Pilot Concrete Channel Infiltration Project* is located within the City of Santee, overlying two hydrologic sub areas, the Santee Hydrologic Sub Area (907.12) and the El Cajon Hydrologic Sub Area (907.13). According to the *Water Quality Control Plan for the San Diego Basin 9* (Basin Plan), these two hydrologic sub areas are designated for municipal and agricultural uses. The Santee Hydrologic Sub Area is also designated for industrial and processing use, and the El Cajon Hydrologic Sub Area is designated as having the potential to provide this use.

The project would facilitate water infiltration in open bottom concrete channels rather than conveying water to surface water bodies, which would likely help to restore the pre-development hydrology of the project area (Woodglen Vista Creek and its tributaries). Infiltration and restoration of historical hydrology will likely provide groundwater recharge benefits to the aforementioned hydrologic sub areas. Although groundwater in the Santee and El Cajon Hydrologic Sub Areas is designated for municipal, agricultural, and industrial use, groundwater in the project area is currently used in a very limited capacity for irrigation at a local mobile home park. It is likely that groundwater will be used in a broader capacity in the near future, because the Padre Dam Municipal Water District (Padre Dam MWD) has proposed a groundwater recharge project near the southern end of Woodglen Vista Creek for water supply purposes. Because

groundwater in the project area is not currently used as a supply source, however, the groundwater recharge (water supply) benefits that would be provided by the project have not been quantified and/or monetized.

This project also has the potential to provide further water supply benefits if it is used as a pilot project and successfully implemented in other locations where infiltration would provide direct groundwater recharge benefits to usable groundwater supplies. These potential benefits have not been quantified or monetized.

Distribution of Project Benefits and Identification of Beneficiaries

Project beneficiaries include regional beneficiaries, and are summarized in Table 7-47 below. If Padre Dam MWD begins using local groundwater for municipal and industrial (M&I) supply as planned, its customers may have additional groundwater supplies available due to infiltration of stormwater runoff into the groundwater basin.

Table 7-47: Project Beneficiaries Summary
Pilot Concrete Channel Infiltration Project

Local	Regional	Statewide
<i>Not Applicable</i>	Padre Dam MWD customers	<i>Not Applicable</i>

Project Benefits Timeline Description

As described previously, this project would potentially result in future benefits associated with groundwater recharge. However, because these benefits were not monetized or quantifiable, there is no timeline associated with these water supply benefits.

Potential Adverse Effects from the Project

Any potential short-term impacts associated with this project will be mitigated through the CEQA compliance process. No long-term adverse effects are expected as a result of this proposed project.

Uncertainty of Benefits

Uncertainties relating to the water supply benefits of this project are summarized below in Table 7-48. Water supply benefits associated with this project will increase if groundwater becomes a source of M&I water supplies in the Santee or El Cajon Hydrologic Sub Areas. If groundwater within the project area becomes used as a water supply source, this project would increase local groundwater supplies and potentially offset the need for future alternative water supplies. Due to the uncertainty associated with these water supply benefits, they can be considered negligible or unknown.

Table 7-48: Omissions, Biases, and Uncertainties and their Effect on the Project
Pilot Concrete Channel Infiltration Project

Benefit or Cost Category	Likely Impact on Net Benefits	Comment
Groundwater Recharge	+/-	If groundwater becomes a source of M&I water supplies in the future, this project would increase local groundwater supplies that could offset need for alternative supplies

* Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Project 9: San Diego Regional Water Quality Assessment and Outreach Project

The *San Diego Regional Water Quality Assessment and Outreach Project* would not result in water supply benefits. The overall benefits of the project are summarized below in Table 7-49. The magnitude of benefits, which were monetized when possible, is summarized in Table 7-50. Detailed cost and benefit information associated with implementation of this project, including present value calculations, is available in Appendix 7-2.

Table 7-49: Benefits Summary
San Diego Regional Water Quality Assessment and Outreach Project

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>

Table 7-50: Benefit-Cost Analysis Overview
San Diego Regional Water Quality Assessment and Outreach Project

	<u>Present Value (\$2009)</u>
Costs – Total Capital and O&M	\$924,578
Monetizable Benefits	
N/A	N/A
Qualitative Benefits	<u>Qualitative Indicator*</u>
N/A	N/A

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

This project would not result in quantifiable and/or monetized water supply benefits, therefore there is no without project baseline for this project with respect to water supply benefits. For further information regarding the without project baseline used to determine water quality and other benefits, please refer to Attachment 8.

Water Supply Benefits

There are no expected water supply benefits associated with this project.

Project 10: Chollas Creek Integration Project

The *Chollas Creek Integration Project* would not result in water supply benefits, but would result in water quality, flood damage reduction and other benefits. These benefits are summarized below in Table 7-51. The magnitude of benefits, which were monetized when possible, is summarized in Table 7-52. Detailed cost and benefit information associated with implementation of this Project, including present value calculations, is available in Appendix 7-2.

Table 7-51: Benefits Summary
Chollas Creek Integration Project

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>

Table 7-52: Benefit-Cost Analysis Overview
Chollas Creek Integration Project

	Present Value (\$2009)
Costs – Total Capital and O&M	\$1,018,096
Monetizable Benefits	
N/A	N/A
Qualitative Benefits	<u>Qualitative Indicator*</u>
N/A	N/A

*Magnitude of effect on net benefits

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

The “Without Project” Baseline

If the *Chollas Creek Integration Project* were not implemented, there would be no restoration of native floodplain habitat or associated flood hazard reductions within Chollas Creek. Please refer to Attachment 8 for a detailed description of the without project water quality and ecological baseline for the project.

Water Supply Benefits

There are no water supply benefits associated with this project.

Project 11: Regional Water Data Management Program

The *Regional Water Data Management Program* would not result in water supply benefits. The overall benefits of the project are summarized below in Table 7-53. The magnitude of benefits, which were not monetized, is summarized in Table 7-54. Detailed cost and benefit information associated with implementation of this project, including present value calculations, is available in Appendix 7-2.

Table 7-53: Benefits Summary
Regional Water Data Management Program

Type of Benefit	Assessment Level	Beneficiaries
Water Supply Benefits		
<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>

Table 7-54: Benefit-Cost Analysis Overview
Regional Water Data Management Program

	Present Value (\$2009)
Costs – Total Capital and O&M	\$540,043
Monetizable Benefits	
N/A	N/A
Qualitative Benefits	<u>Qualitative Indicator*</u>
N/A	N/A

* Magnitude of effect on net benefits:

+/- (negligible or unknown); + (moderate positive); ++ (significant positive); - (moderate negative); -- (significant negative)

Water Supply Benefits

There are no expected water supply benefits associated with this project.

Appendix 7-1: Estimating the Avoided Future Imported Water Supply Costs from Developing Local Supplies in the San Diego Region

Introduction

Water produced by conservation, recycling, groundwater extraction, and other “local sources” will offset the need to use imported water supply. Imported water supply in the San Diego region is derived from the State Water Project (SWP) and/or Colorado River Aqueduct (CRA) from the Metropolitan Water District of Southern California (MWD). The value of adding new local supplies can thus be estimated based on the costs avoided by reducing local demands for imported water. This assumes that expanding local desalinated capacity beyond levels already anticipated would be more expensive than increasing imports, at the margin.¹⁵

The cost savings arising from reducing demands for imported water should be estimated based on the projected future cost of imports, at the margin. This in turn requires a projection of the cost of providing additional imported water, at the levels needed in the future if local resources are not expanded in accordance with the *San Diego IRWM Implementation Grant Proposal*. The key empirical question for valuation is thus, “What is the future cost, at the margin, of acquiring another acre-foot (AF) of imported water, and having it delivered (and treated, where applicable) to the users of the local supply alternatives?”¹⁶

In addition to avoiding water imports, which would affect the San Diego region’s water supply availability, there are project-specific avoided costs that need to be considered and included on a project-by-project basis. For example, an indirect potable reuse (IPR) project would have both the avoided cost of importing water plus the avoided cost of off-loading wastewater treatment and ocean discharge. Another example is a new local groundwater source that is of high enough quality that it can be put directly into the potable system; thus, avoiding the cost of conventional potable treatment [of raw imported water]. Each project assessed in this proposal contains a discussion of project-specific avoided costs.

There are several empirical and conceptual challenges to forecasting the future avoided cost of import water. This appendix discusses these issues and how they were addressed to develop the avoided water supply costs that are used to evaluate the benefits of those projects that provide local water (or conserve water) in the San Diego region.

MWD Wholesale Water Supplies

MWD wholesales water supply to 26 cities and water districts that serve nearly 19 million people in Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura counties. San Diego County Water Authority (SDCWA), who provides water to retailers in the San Diego region, is a member agency of MWD. Rancho California Water District (RCWD), who serves water to customers in the Riverside County portion of the shared Santa Margarita River watershed, purchases water imports from MWD through Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD). MWD currently delivers an average of 1.7 billion gallons of water per day to a 5,200-square mile service area.¹⁷ The district imports water from the SWP and CRA to supplement local supplies, and helps its members to develop increased water conservation, recycling, storage, and other resource-management programs.

¹⁵ If imported water is not readily available at the levels necessary in the future to meet local demand, then the avoided water supply costs would need to be estimated based on the projected cost of expanded future use (i.e., more than currently planned) “local” desalination.

¹⁶ Cost of treatment and delivery need to be included in the avoided import water costs, to provide a suitable “apples-to-apples” comparison of import water costs to the local supplies. This is because the costs used in these analyses for local supplies are generally inclusive of treatment and delivery.

¹⁷ MWD. 2010. About MWD website: <http://www.mwdh2o.com/mwdh2o/pages/about/about01.html>.

Many factors affecting supply and demand for MWD water have impacted water rates over the last several years. Court decisions beginning in 2007 severely impacted Sacramento-San Joaquin Delta exports and reduced dramatically the availability of SWP water to MWD. Concurrently, court decisions and several years of drought have reduced the availability of Colorado River water, historically also a major source of MWD water. These factors have affected the available supply of MWD at all price levels. Additional factors affecting the supply side include changes in the costs of productive inputs such as labor, power, and chemicals for water treatment. Factors affecting the demand for MWD water include conservation efforts, efficient technologies, and the availability of substitute water supply sources, among others. Drought, legal rulings, and basic supply and demand will continue to have important, but at present unknown, impacts on water availability and prices in the future, making both short-term and long-term projections subject to uncertainties characteristic of the forecasting process.

The appropriate unit price for valuing avoided costs of imported water purchases depends upon the type of local supply developed, and in turn, the type of water that would have been used in its place under the without project alternative. It was assumed that increases in water produced locally within the San Diego region through conservation, recycling, and groundwater extraction will replace purchases of MWD water at the full service Tier 1 rate. Application of the treated or untreated full service Tier 1 rate depends on the specifics of each local water supply project.¹⁸

MWD full service treated and untreated Tier 1 water rates were projected beginning with calendar year 2011. Actual MWD full service Tier 1 and replenishment water rates effective January 1, 2009, September 1, 2009 and January 1, 2010 were used for 2009-2010.¹⁹ Water rates published by MWD as effective January 1, 2011 and January 1, 2012 are used for 2011-2012. Rates projected for 2013-2060 were based on projected year-over-year percentage changes in MWD water rates as reported at the MWD Member Agency Manager Meeting on the Long Range Finance Plan (July 2010). A 6 percent annual percentage change was used to forecast MWD rates for 2013-2020, while a 3 percent annual change is used to forecast MWD rates for 2021-2060.²⁰ These annual percentage changes are nominal percentage changes, because they include the effect of inflation on water rates, and projected MWD full service Tier 1 water rates are nominal as a result.

The resulting nominal MWD water rates projected for each year 2009–2060 are deflated to real 2009 dollar values using the Consumer Price Index (all items) for All Urban Consumers (CPI-U) in the Los Angeles-Riverside County-Orange County Metropolitan Statistical Area, for which the actual value was used for 2009 and projected values were used for 2010-2060.²¹ Annual nominal water rates were deflated to 2009 dollar values by the following formula:

$$\text{Real Water Rate}_t = \text{Nominal Water Rate}_t \div (\text{CPI-U}_t \div \text{CPI-U}_{2009})$$

SDCWA Wholesale Water Supplies

SDCWA, who purchases water imports from MWD, wholesales water to 24 member agencies within its service area. The two key uses for water within the service area are municipal and industrial (M&I), which accounts for 85 percent to 90 percent of total consumption; and agricultural, which accounts for the remaining 10 to 15 percent of the total.

¹⁸ To the extent future water use under the without project alternative is supplied by local Tier 2 water rather than imported Tier 1 water, the total value of avoided water import costs presented in this analysis will be understated by the price differential between full service Tier 2 and Tier 1 MWD rates.

¹⁹ Calendar year 2009 water rates were computed as the weighted average of rates effective January-August and September-December.

²⁰ These percentages are used to forecast untreated and treated Tier 1 and untreated replenishment rates.

²¹ For the 2009, the actual value of the CPI-U for the Los Angeles area was utilized. Values for 2010-2020 were projected based on Congressional Budget Office projections for annual changes in the national CPI-U for 2010-2020. In other words, the CPI-U in Los Angeles was assumed to change at the same rate as the CPI-U for the entire nation. For 2021-2060, CPI-U values for the Los Angeles were projected at the average annual percentage change in the national CPI-U for 2012-2014 (1.7%) and 2015-2020 (2.3%).

Since experiencing severe shortages during the 1987-1992 drought, SDCWA has diversified its sources to enhance overall reliability.²² Today, water supplies within the SDCWA service area include imports from MWD, SDCWA supplies (transfer water from IID and canal-lining water), and local supplies of member agencies. Historically, imports have accounted for the single largest proportion of total supplies, followed by SDCWA supplies and local supplies. Imports from MWD are wholesaled to SDCWA from both SWP and CRA supplies. One of 26 MWD member agencies, SDCWA is the largest agency in terms of deliveries, purchasing 518,625 AF or about 25 percent of all the water MWD delivered in FY 05.²³ Both MWD sources have been severely restricted since 2006, however, due to the drought and regulatory restrictions discussed above. Other sources of imported water include the long-term transfer agreement with IID and conserved water from projects lining the All-American and Coachella Canals.²⁴ SDCWA entered into a Water Conservation and Transfer Agreement with IID, an agricultural district in neighboring Imperial County, to receive an annually increasing volume of water from 30,000 AFY in 2005 to 200,000 AFY in 2021. Additionally, the Quantification Settlement Agreement (QSA) on the Colorado River assigned SDCWA rights to 77,700 AFY of conserved water from projects to line the All-American and Coachella Canals. SDCWA also periodically arranges short-term water transfers from agencies in Northern California.

Local water sources for the region include surface water, groundwater, and recycled water. (A seawater desalination plant is expected to go on-line within five years.²⁵) In 1991, local supplies comprised only 5 percent of the Authority's total requirements and MWD imported supplies comprised the remaining 95 percent. By 2010, SDCWA intends to decrease reliance on MWD imports to 62 percent, with increased use of IID transfers and canal-lining waters (21 percent) and local sources (17 percent).²⁶ The local supply goal for 2020 is 40 percent made up of 11 percent from conservation, 10 percent from seawater desalination, 6 percent from recycled water, 7 percent from local surface water, and 6 percent from groundwater.²⁷

Projected Water Rates

SDCWA sells both untreated and treated water to its member agencies. As the name suggests, untreated water is raw and has not been processed to meet minimum standards acceptable for human consumption. Treated water has been treated and meets federal drinking water standards. Because treated water is subject to processing more than the untreated resource, treated water is more expensive. The current treated water surcharge for SDCWA (effective January 1, 2011) is \$215 per AF. Treatment costs have increased to that level from \$125 per AF in calendar year 2006.²⁸

SDCWA has established a two-tier rate structure intended to provide both assurances of needed supplies and encouragement for the local development of water resources by member agencies.²⁹ Including both Tier 1 and Tier 2 classes, SDCWA's water rate schedule parallels that of MWD. Tier 2 rates reflect the cost of developing additional water supplies to enhance the efficient use of local resources.³⁰

For this analysis, only SDCWA Tier 1 rates are projected, as the extent of Tier 2 versus Tier 1 future usage is unknown. The projected future water costs used to calculate the avoided costs of imported water

²² San Diego County Water Authority. 2008. Long-Range Financing Plan 2008. San Diego.

²³ San Diego County Water Authority. 2005. 2005 Urban Water Management Plan Update.

²⁴ For 2011, total IID supply cost to the City of San Diego is \$817 per AF. Note that this is substantially more expensive than comparable untreated MWD imports (\$527 per AF).

²⁵ San Diego County Water Authority. 2008. Long-Range Financing Plan 2008. San Diego.

²⁶ San Diego County Water Authority. 2005. 2005 Urban Water Management Plan Update.

²⁷ Ibid.

²⁸ San Diego County Water Authority. Historical Rates and Charges. Website <http://www.sdcwa.org/historical-rates-and-charges>, accessed December 13, 2010.

²⁹ Bostad, Dennis, et.al. 2008. Identification of Purchase Quantity of Desalinated Water: Sweetwater Authority. American Water Works Association Sustainable Water Sources Conference.

³⁰ MWD. Water Rates and Charges Effective 1/1/2010, 1/1/2011, and 1/1/2012. Website: http://www.mwdh2o.com/mwdh2o/pages/finance/finance_03.html, accessed December 14, 2010.

reflect a melded supply rate and transportation charges. The melded supply rate for untreated water is a weighted average of the MWD Tier 1 full service volumetric rate, Canal lining water rate, and IID supply cost (\$527 per AF, \$383 per AF, and \$817 per AF, respectively, effective January 1, 2011), and aggregates to \$597 per AF effective that date. The corresponding melded supply rate for treated water is \$812 per AF. The transportation charges on both treated and untreated water are \$75 per AF.

SDCWA water prices include both fixed and variable charges. The variable rates, described above, include the untreated and treated melded supply rates plus transportation charges on a per AF basis. Fixed charges are those which are primarily invariant with water volume and include, across all SDCWA water sources, MWD capacity and readiness-to serve charges; and SDCWA customer service, emergency storage, infrastructure access, and property taxes/in-lieu charges. With transportation charges, the SDCWA melded supply rate for untreated water is \$672 per AF and for treated water is \$887 per AF. With all fixed costs included, SDCWA will charge its member agencies \$811 per AF for untreated water and \$1,026 per AF for treated water, effective January 1, 2011. The difference is the treatment surcharge of \$215 per AF.³¹

In addition to the SDCWA rate for Tier 1 water supply, agencies must pay additional MWD fixed charges, including capacity charge and readiness to serve charge. The amount that each member agency pays for water varies slightly due to translation of the MWD and SDCWA fixed rates into volumetric terms. For example, the City of San Diego's total cost for untreated M&I water is \$904 per AF and for treated water is \$1,119 per AF.³² For this analysis, those MWD fixed charges have been translated into volumetric terms based on the 2011 City of San Diego rates.³³

Table 7-1-1 shows the total "all in" rates for imported water supply, including both SDCWA and MWD charges. The total "all in" water rates for M&I supplies purchased from SDCWA are \$864 for untreated water and \$1,079 for treated water (in 2010 dollars).

Table 7-1-1: San Diego Region Water Rates Effective January 1, 2011 (\$2010)

	Untreated (\$/AF)	Treated (\$/AF)
Volumetric Charges¹		
Melded Supply Rate	\$597	\$812
Transportation	\$75	\$75
Melded Tier 1	\$672	\$887
Fixed Charges (in Volumetric Terms)¹		
Storage	\$95	\$95
Customer Service	\$44	\$44
Total Fixed Charges	\$139	\$139
Total SDCWA Costs for M&I Water	\$811	\$1,026
Additional MWD Fixed Charges²		
Capacity Charge	\$14	\$14
Readiness to Serve Charge	\$39	\$39
Total "All In" Costs for M&I Water	\$864	\$1,079

Sources:

1 San Diego County Water Authority. June 24, 2010. Public Hearing: Recommended CY 2011 Rates and Charges.

2 City of San Diego. October 27, 2010. CY 2011 Rate Fact Sheet: SDCWA Water Rates for the City of San Diego Effective January 1, 2011.

³¹ San Diego County Water Authority. June 24, 2010. Public Hearing: Recommended CY 2011 Rates and Charges.

³² City of San Diego. October 27, 2010. CY 2011 Rate Fact Sheet: SDCWA Water Rates for the City of San Diego Effective January 1, 2011.

³³ City of San Diego. October 27, 2010. CY 2011 Rate Fact Sheet: SDCWA Water Rates for the City of San Diego Effective January 1, 2011.

For this study, changes in imported water costs pertinent for SDCWA are based on distinct sources. Actual rates were used for 2008-2010. For 2011, the calendar year 2011 rates proposed by SDCWA are used. The nominal prices in that sheet are divided by the projected 2011 calendar year average Consumer Price Index for All Urban Consumers (CPI-U) in the San Diego region for a real price equivalent. For the period from 2012 through 2014, changes in nominal water rates are based on projections from the SDCWA Long-Range Financing Plan³⁴ as measured in percentage terms. The nominal price change for each year is then deflated by the projected CPI-U for that year. For the period 2015 through 2060, increases in water rates are assumed to be equal to the projected increases in real rates for both treated and untreated MWD supplies.

As with the above MWD rates, future rates beyond 2012 were projected assuming 6 percent annual nominal increases from 2013 through 2020 and 3 percent annual nominal increases thereafter. For 2011, the resulting nominal price was then deflated by the CPI-U for the Los Angeles area, for which the actual value was used for 2009 and projected values were used for 2010-2060. For prices from 2012 through 2060, the price in each year was multiplied by the sum of (1+ real change in CPI) for each year. For example, the real untreated water rate for 2012 was found using the calculation shown below.

$$\text{Real untreated water rate for 2012} = (\text{Real untreated water rate for 2011}) * (1 + \% \text{ change in CPI for 2012}) = \$881 * (1 + 0.0574) = \$930.$$

As shown in Table 7-1-2, the real price of untreated water purchased from SDCWA increases from \$708 per AF in 2009 to \$1,819 per AF in 2060. The real price of treated water increases from \$876 per AF in 2009 to \$2,332 per AF in 2060.

These values are used in the avoided cost analysis for all San Diego region projects except the Implementing Nutrient Management in the Santa Margarita River Watershed project, for which MWD's Tier 2 water rates are used for RCWD imports.

Table 7-1-2: SDCWA Projected Real Treated and Untreated Water Rates, 2009-2060 (\$2009)

Year	SDCWA Real Water Rates (\$/AF)	
	Untreated	Treated
2009	\$649	\$817
2010	\$745	\$956
2011	\$842	\$1,051
2012	\$875	\$1,111
2013	\$909	\$1,143
2014	\$943	\$1,179
2015	\$977	\$1,222
2016	\$1,013	\$1,266
2017	\$1,049	\$1,312
2018	\$1,087	\$1,359
2019	\$1,126	\$1,409
2020	\$1,167	\$1,459
2021	\$1,179	\$1,474
2022	\$1,190	\$1,488
2023	\$1,202	\$1,503
2024	\$1,214	\$1,518
2025	\$1,226	\$1,532
2026	\$1,238	\$1,547
2027	\$1,250	\$1,563
2028	\$1,262	\$1,578

³⁴ San Diego County Water Authority. 2008. Long-Range Financing Plan 2008. San Diego.

Year	SDCWA Real Water Rates (\$/AF)	
	Untreated	Treated
2029	\$1,274	\$1,593
2030	\$1,287	\$1,609
2031	\$1,299	\$1,625
2032	\$1,312	\$1,641
2033	\$1,325	\$1,657
2034	\$1,338	\$1,673
2035	\$1,351	\$1,689
2036	\$1,364	\$1,706
2037	\$1,378	\$1,723
2038	\$1,391	\$1,740
2039	\$1,405	\$1,757
2040	\$1,419	\$1,774
2041	\$1,433	\$1,791
2042	\$1,447	\$1,809
2043	\$1,461	\$1,827
2044	\$1,475	\$1,844
2045	\$1,490	\$1,863
2046	\$1,504	\$1,881
2047	\$1,519	\$1,899
2048	\$1,534	\$1,918
2049	\$1,549	\$1,937
2050	\$1,564	\$1,956
2051	\$1,579	\$1,975
2052	\$1,595	\$1,994
2053	\$1,611	\$2,014
2054	\$1,626	\$2,033
2055	\$1,642	\$2,053
2056	\$1,658	\$2,074
2057	\$1,675	\$2,094
2058	\$1,691	\$2,114
2059	\$1,708	\$2,135
2060	\$1,724	\$2,156

The water supply benefits of local water supply development and conservation projects are typically characterized according to the avoided costs of obtaining the added yields from the least expensive of the other viable supply options. For the San Diego region, such projects avoid the “all in” water supply costs for imported water, as furnished to the region by SDCWA. In the future, the least expensive avoided costs could pertain to local desalination, if that were to become less expensive than imports. Treatment and distribution costs also need to be factored into the cost of avoided import water, because the local options typically include the cost of delivering treated water to the relevant users.

SDCWA’s projected “all in” supply rates – which include the MWD Tier 1 full service volumetric rate, Canal lining water rate, IID supply cost, and various fixed charges – provide a sound basis for beginning the exercise of estimating the avoided cost of imported water. We believe that the avoided costs developed here are generally conservative projections because at the margin, and especially in dry years (but also conceivably in normal ones), offset supplies may need to reflect Tier 2 water rather than Tier 1 water, which are generally more expensive.

RCWD Water Supplies

RCWD lies outside of the San Diego region in southwestern Riverside County. RCWD is a member of the Upper Santa Margarita IRWM program and is a project partner in the *Implementing Nutrient Management in the Santa Margarita River Watershed* project being jointly proposed by the San Diego and Upper Santa Margarita regions. The proposed project could result in avoided water imports by RCWD if found that they could use recycled water instead of imported raw water to augment flows in the Santa Margarita River.

In addition to groundwater (Temecula and Pauba groundwater basins) and recycled water supplies, RCWD purchases water supply from MWD through EMWD and WMWD. Annual imported water purchases by RCWD totaled 51,000 AFY in 2005, or 53 percent of supply.³⁵ To simplify the analysis of avoided imported water costs for RCWD, MWD's Tier 2 untreated water rates in Table 7-1-3 are used for the imported raw water that augments flows in the Santa Margarita River.

Table 7-1-3: MWD Projected Tier 2 Real Water Rates, 2009-2060 (\$2009)

Year	Real MWD Water Rates (\$/AF)		
	Tier 2		
	Tier 2	Peaking*	Total
2010	\$811	\$10	\$821
2011	\$869	\$10	\$879
2012	\$920	\$10	\$930
2013	\$953	\$10	\$963
2014	\$1,000	\$10	\$1,010
2015	\$1,049	\$11	\$1,060
2016	\$1,107	\$11	\$1,118
2017	\$1,144	\$11	\$1,155
2018	\$1,186	\$12	\$1,198
2019	\$1,222	\$12	\$1,234
2020	\$1,259	\$13	\$1,271
2021	\$1,296	\$13	\$1,310
2022	\$1,335	\$14	\$1,349
2023	\$1,375	\$14	\$1,389
2024	\$1,417	\$14	\$1,431
2025	\$1,459	\$15	\$1,474
2026	\$1,503	\$15	\$1,518
2027	\$1,548	\$16	\$1,564
2028	\$1,594	\$16	\$1,611
2029	\$1,642	\$17	\$1,659
2030	\$1,692	\$17	\$1,709
2031	\$1,742	\$18	\$1,760
2032	\$1,795	\$18	\$1,813
2033	\$1,848	\$19	\$1,867
2034	\$1,904	\$19	\$1,923
2035	\$1,961	\$20	\$1,981
2036	\$2,020	\$20	\$2,040
2037	\$2,080	\$21	\$2,101
2038	\$2,143	\$22	\$2,165
2039	\$2,207	\$22	\$2,229

³⁵ Rancho California Water District. 2005. Urban Water Management Plan Update.

Year	<i>Real MWD Water Rates (\$/AF)</i>		
	Tier 2		
	Tier 2	Peaking*	Total
2040	\$2,273	\$23	\$2,296
2041	\$2,341	\$24	\$2,365
2042	\$2,412	\$24	\$2,436
2043	\$2,484	\$25	\$2,509
2044	\$2,559	\$26	\$2,585
2045	\$2,635	\$27	\$2,662
2046	\$2,714	\$28	\$2,742
2047	\$2,796	\$28	\$2,824
2048	\$2,880	\$29	\$2,909
2049	\$2,966	\$30	\$2,996
2050	\$3,055	\$31	\$3,086
2051	\$3,147	\$32	\$3,179
2052	\$3,241	\$33	\$3,274
2053	\$3,338	\$34	\$3,372
2054	\$3,439	\$35	\$3,473
2055	\$3,542	\$36	\$3,578
2056	\$3,648	\$37	\$3,685
2057	\$3,757	\$38	\$3,796
2058	\$3,870	\$39	\$3,909
2059	\$3,986	\$40	\$4,027
2060	\$4,106	\$42	\$4,147

* MWD's peaking charge is assessed on a per CFS basis once a year, the value shown here is the approximate \$/AF cost assuming that any local supply offset reduces peak demands proportionally
Source: MWD, draft long term water rates presented at Member Agency Long Range Finance group (July 2010) through 2019 (after 2019, extended using 3% escalation per year)

Appendix 7-2: Economic Analysis Tables

✓ Project 1: Sustainable Landscapes Program

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Attached
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual <u>Other</u> Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Attached

✓ Project 2: North San Diego County Regional Recycled Water Project

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Attached
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Attached

✓ Project 3: North San Diego County Cooperative Demineralization Project

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Attached
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Attached

✓ Project 4: Rural Disadvantaged Community (DAC) Partnership Project

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Attached
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Attached

✓ Project 5: Lake Hodges Water Quality and Quagga Mitigation Measures

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Attached
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Attached

✓ Project 6: Implementing Nutrient Management in the Santa Margarita River Watershed

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Attached
Table 15 – Total Water Supply Benefits	Attached

✓ Project 7: Bannock Avenue Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Not Applicable

✓ **Project 8: Pilot Concrete Channel Infiltration Project**

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Not Applicable

✓ **Project 9: San Diego Regional Water Quality Assessment and Outreach Project**

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Not Applicable

✓ **Project 10: Chollas Creek Integration Project**

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Not Applicable

✓ **Project 11: Regional Water Data Management Program**

Table 11 – Annual Cost of Project	Attached
Table 12 – Annual Water Supply Benefits	Not Applicable
Table 13 – Annual Costs of Avoided Projects	Not Applicable
Table 14 – Annual Other Water Supply Benefits	Not Applicable
Table 15 – Total Water Supply Benefits	Not Applicable

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
Appendix 7-2**

Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Sustainable Landscapes Program										
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)	
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00		
2010	\$60,784	\$0	\$0	\$0	\$0	\$0	\$60,784	0.94	\$57,319	
2011	\$353,457	\$0	\$0	\$0	\$0	\$0	\$353,457	0.89	\$314,577	
2012	\$358,340	\$0	\$0	\$0	\$0	\$0	\$358,340	0.84	\$301,005	
2013	\$358,340	\$0	\$0	\$0	\$0	\$0	\$358,340	0.79	\$283,805	
2014	\$269,080	\$0	\$0	\$0	\$0	\$0	\$269,080	0.75	\$201,003	
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.71	\$0	
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.67	\$0	
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.63	\$0	
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.59	\$0	
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.56	\$0	
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.53	\$0	
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.50	\$0	
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.47	\$0	
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.44	\$0	
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.42	\$0	
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.39	\$0	
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0	
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0	
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0	
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0	
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0	
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0	
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0	
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0	
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0	
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0	
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0	
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0	
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.19	\$0	
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0	
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0	
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0	
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0	
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0	
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
TOTALS	\$1,400,000	\$0	\$0	\$0	\$0	\$0	\$1,400,000	\$17	\$1,157,709	
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$1,157,709	
Comments: Cost estimates are based on 2010 figures. This pilot will end in 2014, however the benefits will continue beyond. The retrofitted sites have an estimated 10 year life, but only require our involvement in the first year of participation via an incentive and/or education and technical assistance. .										

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**Table 12 - Annual Water Supply Benefits (2009 dollars)
Project: Sustainable Landscapes Program**

(a) Year	(b) Type of Benefit: Avoided imported water supply costs					(b) Type of Benefit:					(b) Type of Benefit:					Discounting Calculations for Economic Benefits		
	(C) Measure of Benefit [Unit]: Acre-Feet per year					(C) Measure of Benefit [Unit]:					(C) Measure of Benefit [Unit]:							
	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(h) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009			0.0		\$0			0		\$0			0		\$0	\$0	1.000	\$0
2010			0.0		\$0			0		\$0			0		\$0	\$0	0.943	\$0
2011			0.0		\$0			0		\$0			0		\$0	\$0	0.890	\$0
2012	-4.0	0.0	4.0	\$1,111	\$4,466			0		\$0			0		\$0	\$4,466	0.840	\$3,751
2013	-8.0	0.0	8.0	\$1,143	\$9,188			0		\$0			0		\$0	\$9,188	0.792	\$7,277
2014	-18.0	0.0	18.0	\$1,179	\$21,227			0		\$0			0		\$0	\$21,227	0.747	\$15,856
2015	-18.0	0.0	18.0	\$1,222	\$21,994			0		\$0			0		\$0	\$21,994	0.705	\$15,506
2016	-18.0	0.0	18.0	\$1,266	\$22,790			0		\$0			0		\$0	\$22,790	0.665	\$15,155
2017	-18.0	0.0	18.0	\$1,312	\$23,614			0		\$0			0		\$0	\$23,614	0.627	\$14,806
2018	-18.0	0.0	18.0	\$1,359	\$24,468			0		\$0			0		\$0	\$24,468	0.592	\$14,485
2019	-18.0	0.0	18.0	\$1,409	\$25,353			0		\$0			0		\$0	\$25,353	0.558	\$14,147
2020	-18.0	0.0	18.0	\$1,459	\$26,270			0		\$0			0		\$0	\$26,270	0.527	\$13,844
2021	-18.0	0.0	18.0	\$1,474	\$26,528			0		\$0			0		\$0	\$26,528	0.497	\$13,184
2022	-18.0	0.0	18.0	\$1,488	\$26,788			0		\$0			0		\$0	\$26,788	0.469	\$12,563
2023			0.0		\$0			0		\$0			0		\$0	\$0	0.442	\$0
2024			0.0		\$0			0		\$0			0		\$0	\$0	0.417	\$0
2025			0.0		\$0			0		\$0			0		\$0	\$0	0.390	\$0
2026			0.0		\$0			0		\$0			0		\$0	\$0	0.371	\$0
2027			0.0		\$0			0		\$0			0		\$0	\$0	0.350	\$0
2028			0.0		\$0			0		\$0			0		\$0	\$0	0.331	\$0
2029			0.0		\$0			0		\$0			0		\$0	\$0	0.312	\$0
2030			0.0		\$0			0		\$0			0		\$0	\$0	0.294	\$0
2031			0.0		\$0			0		\$0			0		\$0	\$0	0.278	\$0
2032			0.0		\$0			0		\$0			0		\$0	\$0	0.262	\$0
2033			0.0		\$0			0		\$0			0		\$0	\$0	0.247	\$0
2034			0.0		\$0			0		\$0			0		\$0	\$0	0.233	\$0
2035			0.0		\$0			0		\$0			0		\$0	\$0	0.220	\$0
2036			0.0		\$0			0		\$0			0		\$0	\$0	0.207	\$0
2037			0.0		\$0			0		\$0			0		\$0	\$0	0.196	\$0
2038			0.0		\$0			0		\$0			0		\$0	\$0	0.185	\$0
2039			0.0		\$0			0		\$0			0		\$0	\$0	0.174	\$0
2040			0.0		\$0			0		\$0			0		\$0	\$0	0.164	\$0
2041			0.0		\$0			0		\$0			0		\$0	\$0	0.155	\$0
2042			0.0		\$0			0		\$0			0		\$0	\$0	0.146	\$0
2043			0.0		\$0			0		\$0			0		\$0	\$0	0.138	\$0
2044			0.0		\$0			0		\$0			0		\$0	\$0	0.130	\$0
2045			0.0		\$0			0		\$0			0		\$0	\$0	0.123	\$0
2046			0.0		\$0			0		\$0			0		\$0	\$0	0.116	\$0
2047			0.0		\$0			0		\$0			0		\$0	\$0	0.109	\$0
2048			0.0		\$0			0		\$0			0		\$0	\$0	0.103	\$0
2049			0.0		\$0			0		\$0			0		\$0	\$0	0.097	\$0
2050			0.0		\$0			0		\$0			0		\$0	\$0	0.092	\$0
2051			0.0		\$0			0		\$0			0		\$0	\$0	0.087	\$0
2052			0.0		\$0			0		\$0			0		\$0	\$0	0.082	\$0
2053			0.0		\$0			0		\$0			0		\$0	\$0	0.077	\$0
2054			0.0		\$0			0		\$0			0		\$0	\$0	0.073	\$0
2055			0.0		\$0			0		\$0			0		\$0	\$0	0.069	\$0
2056			0.0		\$0			0		\$0			0		\$0	\$0	0.065	\$0
2057			0.0		\$0			0		\$0			0		\$0	\$0	0.061	\$0
2058			0.0		\$0			0		\$0			0		\$0	\$0	0.058	\$0
2059			0.0		\$0			0		\$0			0		\$0	\$0	0.054	\$0
2060			0.0		\$0			0		\$0			0		\$0	\$0	0.051	\$0
TOTAL	(174)	-	174	\$14,422	\$232,685	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$232,685	\$14	\$140,576
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):																	\$140,576	
Project Allocation:																	100.0%	
Total Present Value of Discounted Benefits (Monetized Benefits):																	\$140,576	
Narrative Description of Benefit: Using Tier 1 Rates of \$881/AF (SDCWA "All In" 2011 Tier 1 Untreated Water Rate) the projected financial benefit of this project over the 10 year life of the Sustainable Landscape Retrofits is \$145,980 or \$14,598 per year. During year s of retrofit incentive, it is anticipated the program will have up to 224 participants. The benefit listed is proportional to the number of sites completed during that year.																		
Overall Table Comments:																		

San Diego Integrated Regional Water Management
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Table 15 - Total Water Supply Benefits (2009 dollars) Project: Sustainable Landscapes Program			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$140,576	\$0	\$0	\$140,576
Comments:			

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Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: San Diego North Regional Recycled Water Project										
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)	
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0	
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0	
2011	\$500,000	\$0	\$0	\$0	\$0	\$0	\$500,000	0.89	\$445,000	
2012	\$1,000,000	\$0	\$0	\$0	\$0	\$0	\$1,000,000	0.84	\$840,000	
2013	\$500,000	\$0	\$0	\$0	\$0	\$0	\$500,000	0.79	\$396,000	
2014	\$4,125,000	\$0	\$0	\$0	\$0	\$0	\$4,125,000	0.75	\$3,081,375	
2015	\$3,125,000	\$0	\$0	\$0	\$0	\$0	\$3,125,000	0.71	\$2,203,125	
2016	\$3,125,000	\$0	\$227,500	\$227,500	\$113,750	\$0	\$3,693,750	0.67	\$2,456,344	
2017	\$3,125,000	\$0	\$227,500	\$227,500	\$113,750	\$0	\$3,693,750	0.63	\$2,315,981	
2018	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.59	\$336,700	
2019	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.56	\$317,363	
2020	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.53	\$299,731	
2021	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.50	\$282,669	
2022	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.47	\$266,744	
2023	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.44	\$251,388	
2024	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.42	\$237,169	
2025	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.39	\$221,813	
2026	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.37	\$211,006	
2027	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.35	\$199,063	
2028	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.33	\$188,256	
2029	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.31	\$177,450	
2030	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.29	\$167,213	
2031	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.28	\$158,113	
2032	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.26	\$149,013	
2033	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.25	\$140,481	
2034	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.23	\$132,519	
2035	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.22	\$125,125	
2036	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.21	\$117,731	
2037	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.20	\$111,475	
2038	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.19	\$105,219	
2039	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.17	\$98,963	
2040	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.16	\$93,275	
2041	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.16	\$88,156	
2042	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.15	\$83,038	
2043	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.14	\$78,488	
2044	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.13	\$73,938	
2045	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.12	\$69,956	
2046	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.12	\$65,975	
2047	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.11	\$61,994	
2048	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.10	\$58,581	
2049	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.10	\$55,169	
2050	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.09	\$52,325	
2051	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.09	\$49,481	
2052	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.08	\$46,638	
2053	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.08	\$43,794	
2054	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.07	\$41,519	
2055	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.07	\$39,244	
2056	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.07	\$36,969	
2057	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.06	\$34,694	
2058	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.06	\$32,988	
2059	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.05	\$30,877	
2060	\$0	\$0	\$227,500	\$227,500	\$113,750	\$0	\$568,750	0.05	\$29,129	
TOTALS	\$15,500,000	\$0	\$10,237,500	\$10,237,500	\$5,118,750	\$0	\$41,093,750	\$17	\$17,199,249	
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$	17,199,249
Comments: Assumed a \$6 million construction project involving: treatment (40%), pipelines (40%), reservoirs (10%) and booster pump stations (10%). The Admin/O&M/Repair estimates for each of these vary as a percentage of construction: treatment = 10%, pipelines = 0.5% , reservoirs = 1.0%, and booster pump stations = 2.5%. This translates to an average of % of construction, or \$1,137,500 annually. We assumed the following percentages: Operation at 40%, Maintenance at 40%, and Replacement at 20%.										

Table 11

San Diego Integrated Regional Water Management Implementation Grant Proposal Appendix 7-2

Table 12 - Annual Water Supply Benefits (2009 dollars)
Project: San Diego North Regional Recycled Water Project

Table 12 - Annual Water Supply Benefits (2009 dollars)																		
Project: San Diego North Regional Recycled Water Project																		
(a) Year	(b) Type of Benefit: <i>Avoided purchase of imported water</i>					(b) Type of Benefit:					(b) Type of Benefit:					Discounting Calculations for Economic Benefits		
	(C) Measure of Benefit [Unit]: <i>Acre-feet per year</i>					(C) Measure of Benefit [Unit]:					(C) Measure of Benefit [Unit]:							
	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(h) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009			0		\$0			0		\$0			0		\$0	\$0	1.000	\$0
2010			0		\$0			0		\$0			0		\$0	\$0	0.943	\$0
2011			0		\$0			0		\$0			0		\$0	\$0	0.890	\$0
2012			0		\$0			0		\$0			0		\$0	\$0	0.840	\$0
2013			0		\$0			0		\$0			0		\$0	\$0	0.792	\$0
2014			0		\$0			0		\$0			0		\$0	\$0	0.747	\$0
2015			0		\$0			0		\$0			0		\$0	\$0	0.705	\$0
2016	-4,440	0	4,440	\$1,013	\$4,495,909			0		\$0			0		\$0	\$4,495,909	0.665	\$2,989,779
2017	-4,440	0	4,440	\$1,049	\$4,658,524			0		\$0			0		\$0	\$4,658,524	0.627	\$2,920,895
2018	-4,440	0	4,440	\$1,087	\$4,827,017			0		\$0			0		\$0	\$4,827,017	0.592	\$2,857,594
2019	-4,440	0	4,440	\$1,126	\$5,001,606			0		\$0			0		\$0	\$5,001,606	0.558	\$2,790,896
2020	-4,440	0	4,440	\$1,167	\$5,182,501			0		\$0			0		\$0	\$5,182,501	0.527	\$2,731,178
2021	-4,440	0	4,440	\$1,179	\$5,233,303			0		\$0			0		\$0	\$5,233,303	0.497	\$2,600,951
2022	-4,440	0	4,440	\$1,190	\$5,284,618			0		\$0			0		\$0	\$5,284,618	0.469	\$2,478,486
2023	-4,440	0	4,440	\$1,202	\$5,336,424			0		\$0			0		\$0	\$5,336,424	0.442	\$2,358,699
2024	-4,440	0	4,440	\$1,214	\$5,388,733			0		\$0			0		\$0	\$5,388,733	0.417	\$2,247,102
2025	-4,440	0	4,440	\$1,226	\$5,441,560			0		\$0			0		\$0	\$5,441,560	0.390	\$2,122,208
2026	-4,440	0	4,440	\$1,238	\$5,494,900			0		\$0			0		\$0	\$5,494,900	0.371	\$2,038,608
2027	-4,440	0	4,440	\$1,250	\$5,548,770			0		\$0			0		\$0	\$5,548,770	0.350	\$1,942,070
2028	-4,440	0	4,440	\$1,262	\$5,603,169			0		\$0			0		\$0	\$5,603,169	0.331	\$1,854,649
2029	-4,440	0	4,440	\$1,274	\$5,658,096			0		\$0			0		\$0	\$5,658,096	0.312	\$1,765,326
2030	-4,440	0	4,440	\$1,287	\$5,713,570			0		\$0			0		\$0	\$5,713,570	0.294	\$1,679,789
2031	-4,440	0	4,440	\$1,299	\$5,769,591			0		\$0			0		\$0	\$5,769,591	0.278	\$1,603,946
2032	-4,440	0	4,440	\$1,312	\$5,826,149			0		\$0			0		\$0	\$5,826,149	0.262	\$1,526,451
2033	-4,440	0	4,440	\$1,325	\$5,883,262			0		\$0			0		\$0	\$5,883,262	0.247	\$1,453,166
2034	-4,440	0	4,440	\$1,338	\$5,940,936			0		\$0			0		\$0	\$5,940,936	0.233	\$1,384,238
2035	-4,440	0	4,440	\$1,351	\$5,999,177			0		\$0			0		\$0	\$5,999,177	0.220	\$1,319,819
2036	-4,440	0	4,440	\$1,364	\$6,057,993			0		\$0			0		\$0	\$6,057,993	0.207	\$1,254,004
2037	-4,440	0	4,440	\$1,378	\$6,117,390			0		\$0			0		\$0	\$6,117,390	0.196	\$1,199,008
2038	-4,440	0	4,440	\$1,391	\$6,177,363			0		\$0			0		\$0	\$6,177,363	0.185	\$1,142,812
2039	-4,440	0	4,440	\$1,405	\$6,237,922			0		\$0			0		\$0	\$6,237,922	0.174	\$1,085,399
2040	-4,440	0	4,440	\$1,419	\$6,299,079			0		\$0			0		\$0	\$6,299,079	0.164	\$1,033,049
2041	-4,440	0	4,440	\$1,433	\$6,360,831			0		\$0			0		\$0	\$6,360,831	0.155	\$985,929
2042	-4,440	0	4,440	\$1,447	\$6,423,190			0		\$0			0		\$0	\$6,423,190	0.146	\$937,786
2043	-4,440	0	4,440	\$1,461	\$6,486,156			0		\$0			0		\$0	\$6,486,156	0.138	\$895,090
2044	-4,440	0	4,440	\$1,475	\$6,549,745			0		\$0			0		\$0	\$6,549,745	0.130	\$851,467
2045	-4,440	0	4,440	\$1,490	\$6,613,959			0		\$0			0		\$0	\$6,613,959	0.123	\$813,517
2046	-4,440	0	4,440	\$1,504	\$6,678,799			0		\$0			0		\$0	\$6,678,799	0.116	\$774,741
2047	-4,440	0	4,440	\$1,519	\$6,744,272			0		\$0			0		\$0	\$6,744,272	0.109	\$735,126
2048	-4,440	0	4,440	\$1,534	\$6,810,394			0		\$0			0		\$0	\$6,810,394	0.103	\$701,471
2049	-4,440	0	4,440	\$1,549	\$6,877,160			0		\$0			0		\$0	\$6,877,160	0.097	\$667,085
2050	-4,440	0	4,440	\$1,564	\$6,944,578			0		\$0			0		\$0	\$6,944,578	0.092	\$638,901
2051	-4,440	0	4,440	\$1,579	\$7,012,668			0		\$0			0		\$0	\$7,012,668	0.087	\$610,102
2052	-4,440	0	4,440	\$1,595	\$7,081,415			0		\$0			0		\$0	\$7,081,415	0.082	\$580,676
2053	-4,440	0	4,440	\$1,611	\$7,150,843			0		\$0			0		\$0	\$7,150,843	0.077	\$550,615
2054	-4,440	0	4,440	\$1,626	\$7,220,950			0		\$0			0		\$0	\$7,220,950	0.073	\$527,129
2055	-4,440	0	4,440	\$1,642	\$7,291,739			0		\$0			0		\$0	\$7,291,739	0.069	\$503,130
2056	-4,440	0	4,440	\$1,658	\$7,363,222			0		\$0			0		\$0	\$7,363,222	0.065	\$478,609
2057	-4,440	0	4,440	\$1,675	\$7,435,415			0		\$0			0		\$0	\$7,435,415	0.061	\$453,560
2058	-4,440	0	4,440	\$1,691	\$7,508,311			0		\$0			0		\$0	\$7,508,311	0.058	\$435,482
2059	-4,440	0	4,440	\$1,708	\$7,581,927			0		\$0			0		\$0	\$7,581,927	0.054	\$411,610
2060	-4,440	0	4,440	\$1,724	\$7,656,259			0		\$0			0		\$0	\$7,656,259	0.051	\$392,119
TOTAL	-199,800	0	199,800	62,831	278,969,397	0	0	0	0	0	0	0	0	0	0	278,969,397	11	61,324,268
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):																\$61,324,268		
Project Allocation:																100.0%		
Total Present Value of Discounted Benefits (Monetized Benefits):																\$61,324,268		
Narrative description of benefits:			Narrative description of benefits:			Narrative description of benefits:			Narrative description of benefits:			Narrative description of benefits:			Narrative description of benefits:			
Comments:																		

San Diego Integrated Regional Water Management
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Table 15 - Total Water Supply Benefits (2009 dollars) Project: San Diego North Regional Recycled Water Project			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$61,324,268	\$0	\$0	\$61,324,268
Comments:			

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Table 11 - Annual Cost of Project									
(All costs should be in 2009 dollars)									
Project: North San Diego County Cooperative Demineralization Project									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$159,699	\$2,000	\$60,000	\$10,000	\$0	\$0	\$231,699	1.00	\$231,699
2010	\$431,434	\$2,000	\$60,000	\$10,000	\$0	\$0	\$503,434	0.94	\$474,738
2011	\$4,411,944	\$2,000	\$60,000	\$10,000	\$0	\$0	\$4,483,944	0.89	\$3,990,710
2012	\$6,381,723	\$2,000	\$60,000	\$10,000	\$0	\$0	\$6,453,723	0.84	\$5,421,127
2013	\$7,333,333	\$2,000	\$60,000	\$10,000	\$0	\$0	\$7,405,333	0.79	\$5,865,024
2014	\$7,333,333	\$2,000	\$60,000	\$10,000	\$0	\$0	\$7,405,333	0.75	\$5,531,784
2015	\$7,333,333	\$2,000	\$60,000	\$10,000	\$0	\$0	\$7,405,333	0.71	\$5,220,760
2016	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.67	\$47,880
2017	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.63	\$45,144
2018	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.59	\$42,624
2019	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.56	\$40,176
2020	\$0	\$2,000	\$60,000	\$10,000	\$250,000	\$0	\$322,000	0.53	\$169,694
2021	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.50	\$35,784
2022	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.47	\$33,768
2023	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.44	\$31,824
2024	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.42	\$30,024
2025	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.39	\$28,080
2026	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.37	\$26,712
2027	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.35	\$25,200
2028	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.33	\$23,832
2029	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.31	\$22,464
2030	\$0	\$2,000	\$60,000	\$10,000	\$250,000	\$0	\$322,000	0.29	\$94,668
2031	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.28	\$20,016
2032	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.26	\$18,864
2033	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.25	\$17,784
2034	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.23	\$16,776
2035	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.22	\$15,840
2036	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.21	\$14,904
2037	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.20	\$14,112
2038	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.19	\$13,320
2039	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.17	\$12,528
2040	\$0	\$2,000	\$60,000	\$10,000	\$250,000	\$0	\$322,000	0.16	\$52,808
2041	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.16	\$11,160
2042	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.15	\$10,512
2043	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.14	\$9,936
2044	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.13	\$9,360
2045	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.12	\$8,856
2046	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.12	\$8,352
2047	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.11	\$7,848
2048	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.10	\$7,416
2049	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.10	\$6,984
2050	\$0	\$2,000	\$60,000	\$10,000	\$250,000	\$0	\$322,000	0.09	\$29,624
2051	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.09	\$6,264
2052	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.08	\$5,904
2053	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.08	\$5,544
2054	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.07	\$5,256
2055	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.07	\$4,968
2056	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.07	\$4,680
2057	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.06	\$4,392
2058	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.06	\$4,176
2059	\$0	\$2,000	\$60,000	\$10,000	\$0	\$0	\$72,000	0.05	\$3,909
2060	\$0	\$2,000	\$60,000	\$10,000	\$250,000	\$0	\$322,000	0.05	\$16,491
Totals	\$33,384,800	\$104,000	\$3,120,000	\$520,000	\$1,250,000	\$0	\$38,378,800	\$17	\$27,802,301
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$27,802,301
Comments: Administration costs include general administrative activities including but not limited to ordering parts, coordination with vendors, and tracking costs and time (assumed \$2000 annually). Operations costs include labor for daily operation of facilities, energy costs, and chemical costs (assumed \$60,000 annually). Maintenance costs includes labor and parts for routine and emergency maintenance, as needed (assumed \$10,000 annually). Replacement costs includes routine replacement of membranes, pumps, electrical equipment, etc. over the life of the project (assumed \$250,000 every 10 years).									

Table 11

**San Diego Integrated Regional Water Management
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Table 12 - Annual Water Supply Benefits (2009 dollars)													
Project: North San Diego County Cooperative Demineralization Project													
(a) Year	(b) Type of Benefit: <i>Avoided cost of imported water (due to reclaimed water)</i>					(b) Type of Benefit: <i>Avoided cost if imported water (desalination)</i>					Discounting Calculations for Economic Benefits		
	(c) Measure of Benefit [Unit]: <i>Acre-feet per year</i>					(c) Measure of Benefit [Unit]: <i>Acre-feet per year</i>							
	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(h) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009			0		\$0					\$0	\$0	1.000	\$0
2010			0		\$0					\$0	\$0	0.943	\$0
2011			0		\$0					\$0	\$0	0.890	\$0
2012	-3,340	0	3,340	\$875	\$2,923,924	-1,122	0	1,122	\$875	\$0	\$2,923,924	0.840	\$2,456,097
2013	-3,340	0	3,340	\$909	\$3,035,232	-1,122	0	1,122	\$909	\$0	\$3,035,232	0.792	\$2,403,904
2014	-3,340	0	3,340	\$943	\$3,150,079	-1,122	0	1,122	\$943	\$0	\$3,150,079	0.747	\$2,353,109
2015	-3,340	0	3,340	\$977	\$3,264,006	-1,122	0	1,122	\$977	\$0	\$3,264,006	0.705	\$2,301,124
2016	-3,340	0	3,340	\$1,013	\$3,382,058	-1,122	0	1,122	\$1,013	\$0	\$3,382,058	0.665	\$2,249,068
2017	-3,340	0	3,340	\$1,049	\$3,504,385	-1,122	0	1,122	\$1,049	\$0	\$3,504,385	0.627	\$2,197,250
2018	-3,340	0	3,340	\$1,087	\$3,631,135	-1,122	0	1,122	\$1,087	\$0	\$3,631,135	0.592	\$2,149,632
2019	-3,340	0	3,340	\$1,126	\$3,762,470	-1,122	0	1,122	\$1,126	\$0	\$3,762,470	0.558	\$2,099,458
2020	-3,340	0	3,340	\$1,167	\$3,898,548	-1,122	0	1,122	\$1,167	\$0	\$3,898,548	0.527	\$2,054,535
2021	-3,340	0	3,340	\$1,179	\$3,936,764	-1,122	0	1,122	\$1,179	\$0	\$3,936,764	0.497	\$1,956,572
2022	-3,340	0	3,340	\$1,190	\$3,975,366	-1,122	0	1,122	\$1,190	\$0	\$3,975,366	0.469	\$1,864,446
2023	-3,340	0	3,340	\$1,202	\$4,014,337	-1,122	0	1,122	\$1,202	\$0	\$4,014,337	0.442	\$1,774,337
2024	-3,340	0	3,340	\$1,214	\$4,053,687	-1,122	0	1,122	\$1,214	\$0	\$4,053,687	0.417	\$1,690,387
2025	-3,340	0	3,340	\$1,226	\$4,093,425	-1,122	0	1,122	\$1,226	\$0	\$4,093,425	0.390	\$1,596,436
2026	-3,340	0	3,340	\$1,238	\$4,133,551	-1,122	0	1,122	\$1,238	\$0	\$4,133,551	0.371	\$1,533,547
2027	-3,340	0	3,340	\$1,250	\$4,174,075	-1,122	0	1,122	\$1,250	\$0	\$4,174,075	0.350	\$1,460,926
2028	-3,340	0	3,340	\$1,262	\$4,214,996	-1,122	0	1,122	\$1,262	\$0	\$4,214,996	0.331	\$1,395,164
2029	-3,340	0	3,340	\$1,274	\$4,256,316	-1,122	0	1,122	\$1,274	\$0	\$4,256,316	0.312	\$1,327,970
2030	-3,340	0	3,340	\$1,287	\$4,298,046	-1,122	0	1,122	\$1,287	\$0	\$4,298,046	0.294	\$1,263,625
2031	-3,340	0	3,340	\$1,299	\$4,340,188	-1,122	0	1,122	\$1,299	\$0	\$4,340,188	0.278	\$1,206,572
2032	-3,340	0	3,340	\$1,312	\$4,382,733	-1,122	0	1,122	\$1,312	\$0	\$4,382,733	0.262	\$1,148,276
2033	-3,340	0	3,340	\$1,325	\$4,425,697	-1,122	0	1,122	\$1,325	\$0	\$4,425,697	0.247	\$1,093,147
2034	-3,340	0	3,340	\$1,338	\$4,469,083	-1,122	0	1,122	\$1,338	\$0	\$4,469,083	0.233	\$1,041,296
2035	-3,340	0	3,340	\$1,351	\$4,512,895	-1,122	0	1,122	\$1,351	\$0	\$4,512,895	0.220	\$992,837
2036	-3,340	0	3,340	\$1,364	\$4,557,139	-1,122	0	1,122	\$1,364	\$0	\$4,557,139	0.207	\$943,328
2037	-3,340	0	3,340	\$1,378	\$4,601,820	-1,122	0	1,122	\$1,378	\$0	\$4,601,820	0.196	\$901,957
2038	-3,340	0	3,340	\$1,391	\$4,646,935	-1,122	0	1,122	\$1,391	\$0	\$4,646,935	0.185	\$859,683
2039	-3,340	0	3,340	\$1,405	\$4,692,491	-1,122	0	1,122	\$1,405	\$0	\$4,692,491	0.174	\$816,493
2040	-3,340	0	3,340	\$1,419	\$4,738,496	-1,122	0	1,122	\$1,419	\$0	\$4,738,496	0.164	\$777,113
2041	-3,340	0	3,340	\$1,433	\$4,784,949	-1,122	0	1,122	\$1,433	\$0	\$4,784,949	0.155	\$741,667
2042	-3,340	0	3,340	\$1,447	\$4,831,859	-1,122	0	1,122	\$1,447	\$0	\$4,831,859	0.146	\$705,451
2043	-3,340	0	3,340	\$1,461	\$4,879,226	-1,122	0	1,122	\$1,461	\$0	\$4,879,226	0.138	\$673,333
2044	-3,340	0	3,340	\$1,475	\$4,927,061	-1,122	0	1,122	\$1,475	\$0	\$4,927,061	0.130	\$640,518
2045	-3,340	0	3,340	\$1,490	\$4,975,365	-1,122	0	1,122	\$1,490	\$0	\$4,975,365	0.123	\$611,970
2046	-3,340	0	3,340	\$1,504	\$5,024,142	-1,122	0	1,122	\$1,504	\$0	\$5,024,142	0.116	\$582,800
2047	-3,340	0	3,340	\$1,519	\$5,073,393	-1,122	0	1,122	\$1,519	\$0	\$5,073,393	0.109	\$553,000
2048	-3,340	0	3,340	\$1,534	\$5,123,134	-1,122	0	1,122	\$1,534	\$0	\$5,123,134	0.103	\$527,683
2049	-3,340	0	3,340	\$1,549	\$5,173,359	-1,122	0	1,122	\$1,549	\$0	\$5,173,359	0.097	\$501,816
2050	-3,340	0	3,340	\$1,564	\$5,224,074	-1,122	0	1,122	\$1,564	\$0	\$5,224,074	0.092	\$480,615
2051	-3,340	0	3,340	\$1,579	\$5,275,295	-1,122	0	1,122	\$1,579	\$0	\$5,275,295	0.087	\$458,951
2052	-3,340	0	3,340	\$1,595	\$5,327,011	-1,122	0	1,122	\$1,595	\$0	\$5,327,011	0.082	\$436,815
2053	-3,340	0	3,340	\$1,611	\$5,379,238	-1,122	0	1,122	\$1,611	\$0	\$5,379,238	0.077	\$414,201
2054	-3,340	0	3,340	\$1,626	\$5,431,976	-1,122	0	1,122	\$1,626	\$0	\$5,431,976	0.073	\$396,534
2055	-3,340	0	3,340	\$1,642	\$5,485,227	-1,122	0	1,122	\$1,642	\$0	\$5,485,227	0.069	\$378,481
2056	-3,340	0	3,340	\$1,658	\$5,539,000	-1,122	0	1,122	\$1,658	\$0	\$5,539,000	0.065	\$360,035
2057	-3,340	0	3,340	\$1,675	\$5,593,308	-1,122	0	1,122	\$1,675	\$0	\$5,593,308	0.061	\$341,192
2058	-3,340	0	3,340	\$1,691	\$5,648,144	-1,122	0	1,122	\$1,691	\$0	\$5,648,144	0.058	\$327,592
2059	-3,340	0	3,340	\$1,708	\$5,703,522	-1,122	0	1,122	\$1,708	\$0	\$5,703,522	0.054	\$309,635
2060	-3,340	0	3,340	\$1,724	\$5,759,438	-1,122	0	1,122	\$1,724	\$0	\$5,759,438	0.051	\$294,972
TOTAL	-163,660	0	163,660	66,536	222,228,598	-54,978	0	54,978	66,536	0	222,228,598	14	55,645,552
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):													\$55,645,552
Project Allocation:													100.0%
Total Present Value of Discounted Benefits (Monetized Benefits):													\$55,645,552
Narrative description of benefits: This project will construct demineralization facilities that will increase the local recycled water production capacity of the SEWRf by 560 AFY, thereby reducing the need for 560 AFY of imported water. In addition the project protects existing production capacity of 2,780 AFY by ensuring permit and contractual compliance.						Narrative description of benefits: This project will provide a feasibility study for expanding brackish groundwater to potable water production by 1120 AFY. This represents "new" water as the basin is not currently utilized. This also represents a "drought proof" supply which could result in a highly reliable new water source. However values are represented as "zero" because initial and O&M costs for a desalination facility are not currently							
Comments: The Updated Financial Assessment for the SEJPA Recycled Water System describes the SEJPA's recycled water rate structure. The cost of potable water was derived from the SDCWA 10 year plan.													

Table 12

San Diego Integrated Regional Water Management
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Table 15 - Total Water Supply Benefits (2009 dollars) Project: North San Diego County Cooperative Demineralization Project			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$55,645,552	\$0	\$0	\$55,645,552
Comments:			

**San Diego Integrated Regional Water Management
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Table 11 - Annual Cost of Project										
(All costs should be in 2009 dollars)										
Project: Rural Disadvantaged Community (DAC) Partnership Project										
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)	
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0	
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0	
2011	\$51,667	\$0	\$0	\$0	\$0	\$312,000	\$363,667	0.89	\$323,663	
2012	\$103,333	\$0	\$0	\$0	\$0	\$0	\$103,333	0.84	\$86,800	
2013	\$375,000	\$0	\$0	\$0	\$0	\$0	\$375,000	0.79	\$297,000	
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.75	\$0	
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.71	\$0	
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.67	\$0	
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.63	\$0	
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.59	\$0	
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.56	\$0	
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.53	\$0	
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.50	\$0	
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.47	\$0	
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.44	\$0	
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.42	\$0	
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.39	\$0	
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0	
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0	
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0	
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0	
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0	
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0	
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0	
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0	
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0	
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0	
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0	
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0	
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.19	\$0	
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0	
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0	
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0	
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0	
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0	
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
TOTALS	\$530,000	\$0	\$0	\$0	\$0	\$312,000	\$842,000	\$17	\$707,463	
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$707,463	
Comments: Implementation of the two sample projects include \$251,000 for Sample Project 1: MGB Well Rehab and Treatment Plant Renovation and \$566,000 for Sample Project 2: SCWWD Robbins Wastewater Rehabilitation = \$817,000. Assuming that \$505,000 of the proposed budget goes to project implementation, approximately \$312,000 in additional capital costs will be sought from U.S. Department of Agriculture (USDA) Rural Development, U.S. Environmental Protection Agency (USEPA) Region 9, Indian Health Services, and Rural Community Assistance Partnership.										
The above table will be completed upon project selection. RCAC will solicit and select DAC projects in 2011, at that time it is anticipated that several projects will be selected (at least one tribal) that will address critical water and/or wastewater needs. DAC projects may not have the economic base to fully support ongoing O&M needs. In addition, DACs may not have adequately trained personell that can provide effective O&M of new infrastructure. To offset these shortcomings RCAC will do the following: 1. In the selection process determine how the project will be sustained. 2. Whenever possible select technologies that are straight forward and require less technical expertise and expense to operate. 3. RCAC will provide technical assistance and training during project start up to bring staff up to speed on proper O&M. 4. RCAC will work with outside entities such as the Indian Health Services and the California Rural Water Association to further support the O&M of each project through ongoing technical assistance. This additional TA will not use Prop 84 unds but will be provided by other RCAC resouces leveraging Prop 84										

Table 11

San Diego Integrated Regional Water Management Implementation Grant Proposal Appendix 7-2

Table 12 - Annual Water Supply Benefits (2009 dollars)

Project: Rural Disadvantaged Community (DAC) Partnership Project

Table 12 - Annual Water Supply Benefits (2009 dollars) Project: Rural Disadvantaged Community (DAC) Partnership Project																		
(a) Year	(b) Type of Benefit: <i>Avoided purchase of bottled drinking water (due to drinking water constraints)</i>					(b) Type of Benefit:					(b) Type of Benefit:					Discounting Calculations for Economic Benefits		
	(C) Measure of Benefit [Unit]: <i>Gallons per person/year</i>					(C) Measure of Benefit [Unit]:					(C) Measure of Benefit [Unit]:							
	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(h) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009			0		\$0											\$0	1.000	\$0
2010			0		\$0											\$0	0.943	\$0
2011	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.890	\$14,212
2012	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.840	\$13,414
2013	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.792	\$12,647
2014	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.747	\$11,929
2015	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.705	\$11,258
2016	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.665	\$10,619
2017	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.627	\$10,012
2018	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.592	\$9,454
2019	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.558	\$8,911
2020	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.527	\$8,416
2021	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.497	\$7,936
2022	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.469	\$7,489
2023	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.442	\$7,058
2024	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.417	\$6,659
2025	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.390	\$6,228
2026	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.371	\$5,924
2027	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.350	\$5,589
2028	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.331	\$5,286
2029	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.312	\$4,982
2030	-9,125	0	9,125	\$1.75	\$15,969											\$15,969	0.294	\$4,695
2031																\$0	0.278	\$0
2032																\$0	0.262	\$0
2033																\$0	0.247	\$0
2034																\$0	0.233	\$0
2035																\$0	0.220	\$0
2036																\$0	0.207	\$0
2037																\$0	0.196	\$0
2038																\$0	0.185	\$0
2039																\$0	0.174	\$0
2040																\$0	0.164	\$0
2041																\$0	0.155	\$0
2042																\$0	0.146	\$0
2043																\$0	0.138	\$0
2044																\$0	0.130	\$0
2045																\$0	0.123	\$0
2046																\$0	0.116	\$0
2047																\$0	0.109	\$0
2048																\$0	0.103	\$0
2049																\$0	0.097	\$0
2050																\$0	0.092	\$0
2051																\$0	0.087	\$0
2052																\$0	0.082	\$0
2053																\$0	0.077	\$0
2054																\$0	0.073	\$0
2055																\$0	0.069	\$0
2056																\$0	0.065	\$0
2057																\$0	0.061	\$0
2058																\$0	0.058	\$0
2059																\$0	0.054	\$0
2060																\$0	0.051	\$0
TOTAL	-182,500	0	182,500	35	319,375	0	0	0	0	0	0	0	0	0	0	319,375	15	172,718
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):																	\$172,718	
Project Allocation:																	100.0%	
Total Present Value of Discounted Benefits (Monetized Benefits):																	\$172,718	
Narrative description of benefits: <i>To modify sole source well for increased production and replace iron/mg treatment that has never worked. Source does not meet existing demands; community rationing. Public purchases bottled water to avoid public water supply. Assume half of population uses bottled water.</i>						Narrative description of benefits:					Narrative description of benefits:							
Comments: Depending on project selection, O&M costs associated with DAC projects may actually be less than what communities are currently experiencing. DAC communities have antiquated inefficient pumping and treatment equipment. Distribution systems are usually very old with excessive leakage. O&M costs due to excessive water loss and continuous repairs make these older systems much more expensive to operate and maintain. These systems generally have routine unplanned overtime expenses, high power bills and higher treatment expenses. These costs then have to be spread over a very small customer base making improvements nearly impossible to fund. DAC projects will be selected from a holistic approach: 1. Addressing the critical need. 2. Evaluating the most efficient, cost effective processes that meet the need. 3. Community staff education on how best to maximize the 'life cycle cost' of the project and water use efficiency practices best suited for that community.																		

San Diego Integrated Regional Water Management
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Table 15 - Total Water Supply Benefits (2009 dollars) Project: Rural Disadvantaged Community (DAC) Partnership Project			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$172,718	\$0	\$0	\$172,718
Comments:			

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
Appendix 7-2**

Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Lake Hodges Water Quality and Quagga Mitigation Measures									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0
2010	\$57,391	\$0	\$0	\$0	\$0	\$0	\$57,391	0.94	\$54,119
2011	\$323,828	\$0	\$0	\$0	\$0	\$0	\$323,828	0.89	\$288,207
2012	\$311,021	\$0	\$0	\$0	\$0	\$0	\$311,021	0.84	\$261,258
2013	\$507,760	\$0	\$0	\$0	\$0	\$0	\$507,760	0.79	\$402,146
2014	\$0	\$10,240	\$6,000	\$30,000	\$0	\$0	\$46,240	0.75	\$34,541
2015	\$0	\$9,600	\$6,000	\$25,000	\$0	\$0	\$40,600	0.71	\$28,623
2016	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.67	\$24,871
2017	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.63	\$23,450
2018	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.59	\$22,141
2019	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.56	\$20,869
2020	\$0	\$9,600	\$6,000	\$35,000	\$0	\$0	\$50,600	0.53	\$26,666
2021	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.50	\$18,588
2022	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.47	\$17,541
2023	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.44	\$16,531
2024	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.42	\$15,596
2025	\$0	\$9,600	\$6,000	\$35,000	\$20,000	\$0	\$70,600	0.39	\$27,534
2026	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.37	\$13,875
2027	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.35	\$13,090
2028	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.33	\$12,379
2029	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.31	\$11,669
2030	\$0	\$9,600	\$6,000	\$35,000	\$0	\$0	\$50,600	0.29	\$14,876
2031	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.28	\$10,397
2032	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.26	\$9,799
2033	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.25	\$9,238
2034	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.23	\$8,714
2035	\$0	\$9,600	\$6,000	\$35,000	\$20,000	\$0	\$70,600	0.22	\$15,532
2036	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.21	\$7,742
2037	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.20	\$7,330
2038	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.19	\$6,919
2039	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.17	\$6,508
2040	\$0	\$9,600	\$6,000	\$35,000	\$0	\$0	\$50,600	0.16	\$8,298
2041	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.16	\$5,797
2042	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.15	\$5,460
2043	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.14	\$5,161
2044	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.13	\$4,862
2045	\$0	\$9,600	\$6,000	\$35,000	\$20,000	\$0	\$70,600	0.12	\$8,684
2046	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.12	\$4,338
2047	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.11	\$4,077
2048	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.10	\$3,852
2049	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.10	\$3,628
2050	\$0	\$9,600	\$6,000	\$35,000	\$0	\$0	\$50,600	0.09	\$4,655
2051	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.09	\$3,254
2052	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.08	\$3,067
2053	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.08	\$2,880
2054	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.07	\$2,730
2055	\$0	\$9,600	\$6,000	\$35,000	\$20,000	\$0	\$70,600	0.07	\$4,871
2056	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.07	\$2,431
2057	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.06	\$2,281
2058	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.06	\$2,169
2059	\$0	\$6,400	\$6,000	\$25,000	\$0	\$0	\$37,400	0.05	\$2,030
2060	\$0	\$9,600	\$6,000	\$35,000	\$0	\$0	\$50,600	0.05	\$2,592
TOTAL	\$1,200,000	\$336,640	\$282,000	\$1,270,000	\$80,000	\$0	\$3,168,640	\$17	\$1,517,868
Project Life	Total Present Value of Discounted Costs (Sum of Column (i))								
	Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								
Comments: A small amount of construction is included in this project. The actual item(s) to be constructed are yet to be determined and will be based on the outcome of a feasibility study and prioritization effort included in this project. The estimates above are based on construction of quagga control measures at Lake Hodges Pumped Storage Facility. Administration, operations, and maintenance costs are based on SDCWA experience managing the Lake Hodges Pumped Storage Facility. Major maintenance and cleaning is anticipated in 5-year increments. Complete replacement of some facilities is anticipated at 10-year increments.									

Table 11

San Diego Integrated Regional Water Management Implementation Grant Proposal Appendix 7-2

Table 12 - Annual Water Supply Benefits (2009 dollars)

Project: Lake Hodges Water Quality and Quagga Mitigation Measures

Table 12 - Annual Water Supply Benefits (2009 dollars)																		
Project: Lake Hodges Water Quality and Quagga Mitigation Measures																		
(a) Year	(b) Type of Benefit: Increased Water Supply Usability					(b) Type of Benefit:					(b) Type of Benefit:					Discounting Calculations for Economic Benefits		
	(C) Measure of Benefit [Unit]: Acre-Feet per Year					(C) Measure of Benefit [Unit]:					(C) Measure of Benefit [Unit]:							
	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(d) Without Project	(e) With Project	(f) Change Resulting from Project [e - d]	(g) Unit \$ Value	(h) Annual \$ Value [f x g]	(h) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009			0		\$0			0		\$0			0		\$0	\$0	1.000	\$0
2010			0		\$0			0		\$0			0		\$0	\$0	0.943	\$0
2011	9,000	11,400	2,400	\$842	\$2,020,744			0		\$0			0		\$0	\$2,020,744	0.890	\$1,798,462
2012	9,000	11,400	2,400	\$875	\$2,101,024			0		\$0			0		\$0	\$2,101,024	0.840	\$1,764,860
2013	9,000	11,400	2,400	\$909	\$2,181,005			0		\$0			0		\$0	\$2,181,005	0.792	\$1,727,356
2014	9,000	11,400	2,400	\$943	\$2,263,530			0		\$0			0		\$0	\$2,263,530	0.747	\$1,690,857
2015	9,000	11,400	2,400	\$977	\$2,345,393			0		\$0			0		\$0	\$2,345,393	0.705	\$1,653,502
2016	9,000	11,400	2,400	\$1,013	\$2,430,221			0		\$0			0		\$0	\$2,430,221	0.665	\$1,616,097
2017	9,000	11,400	2,400	\$1,049	\$2,518,121			0		\$0			0		\$0	\$2,518,121	0.627	\$1,578,862
2018	9,000	11,400	2,400	\$1,087	\$2,609,199			0		\$0			0		\$0	\$2,609,199	0.592	\$1,544,646
2019	9,000	11,400	2,400	\$1,126	\$2,703,571			0		\$0			0		\$0	\$2,703,571	0.558	\$1,508,593
2020	9,000	11,400	2,400	\$1,167	\$2,801,352			0		\$0			0		\$0	\$2,801,352	0.527	\$1,476,312
2021	9,000	11,400	2,400	\$1,179	\$2,828,812			0		\$0			0		\$0	\$2,828,812	0.497	\$1,405,920
2022	9,000	11,400	2,400	\$1,190	\$2,856,550			0		\$0			0		\$0	\$2,856,550	0.469	\$1,339,722
2023	9,000	11,400	2,400	\$1,202	\$2,884,553			0		\$0			0		\$0	\$2,884,553	0.442	\$1,274,973
2024	9,000	11,400	2,400	\$1,214	\$2,912,829			0		\$0			0		\$0	\$2,912,829	0.417	\$1,214,650
2025	9,000	11,400	2,400	\$1,226	\$2,941,384			0		\$0			0		\$0	\$2,941,384	0.390	\$1,147,140
2026	9,000	11,400	2,400	\$1,238	\$2,970,216			0		\$0			0		\$0	\$2,970,216	0.371	\$1,101,950
2027	9,000	11,400	2,400	\$1,250	\$2,999,335			0		\$0			0		\$0	\$2,999,335	0.350	\$1,049,767
2028	9,000	11,400	2,400	\$1,262	\$3,028,740			0		\$0			0		\$0	\$3,028,740	0.331	\$1,002,513
2029	9,000	11,400	2,400	\$1,274	\$3,058,430			0		\$0			0		\$0	\$3,058,430	0.312	\$954,230
2030	9,000	11,400	2,400	\$1,287	\$3,088,416			0		\$0			0		\$0	\$3,088,416	0.294	\$907,994
2031	9,000	11,400	2,400	\$1,299	\$3,118,698			0		\$0			0		\$0	\$3,118,698	0.278	\$866,998
2032	9,000	11,400	2,400	\$1,312	\$3,149,270			0		\$0			0		\$0	\$3,149,270	0.262	\$825,109
2033	9,000	11,400	2,400	\$1,325	\$3,180,142			0		\$0			0		\$0	\$3,180,142	0.247	\$785,495
2034	9,000	11,400	2,400	\$1,338	\$3,211,317			0		\$0			0		\$0	\$3,211,317	0.233	\$748,237
2035	9,000	11,400	2,400	\$1,351	\$3,242,799			0		\$0			0		\$0	\$3,242,799	0.220	\$713,416
2036	9,000	11,400	2,400	\$1,364	\$3,274,591			0		\$0			0		\$0	\$3,274,591	0.207	\$677,840
2037	9,000	11,400	2,400	\$1,378	\$3,306,697			0		\$0			0		\$0	\$3,306,697	0.196	\$648,113
2038	9,000	11,400	2,400	\$1,391	\$3,339,115			0		\$0			0		\$0	\$3,339,115	0.185	\$617,736
2039	9,000	11,400	2,400	\$1,405	\$3,371,850			0		\$0			0		\$0	\$3,371,850	0.174	\$586,702
2040	9,000	11,400	2,400	\$1,419	\$3,404,908			0		\$0			0		\$0	\$3,404,908	0.164	\$558,405
2041	9,000	11,400	2,400	\$1,433	\$3,438,287			0		\$0			0		\$0	\$3,438,287	0.155	\$532,934
2042	9,000	11,400	2,400	\$1,447	\$3,471,994			0		\$0			0		\$0	\$3,471,994	0.146	\$506,911
2043	9,000	11,400	2,400	\$1,461	\$3,506,031			0		\$0			0		\$0	\$3,506,031	0.138	\$483,832
2044	9,000	11,400	2,400	\$1,475	\$3,540,403			0		\$0			0		\$0	\$3,540,403	0.130	\$460,252
2045	9,000	11,400	2,400	\$1,490	\$3,575,113			0		\$0			0		\$0	\$3,575,113	0.123	\$439,739
2046	9,000	11,400	2,400	\$1,504	\$3,610,162			0		\$0			0		\$0	\$3,610,162	0.116	\$418,779
2047	9,000	11,400	2,400	\$1,519	\$3,645,552			0		\$0			0		\$0	\$3,645,552	0.109	\$397,365
2048	9,000	11,400	2,400	\$1,534	\$3,681,294			0		\$0			0		\$0	\$3,681,294	0.103	\$379,173
2049	9,000	11,400	2,400	\$1,549	\$3,717,384			0		\$0			0		\$0	\$3,717,384	0.097	\$360,586
2050	9,000	11,400	2,400	\$1,564	\$3,753,826			0		\$0			0		\$0	\$3,753,826	0.092	\$345,352
2051	9,000	11,400	2,400	\$1,579	\$3,790,631			0		\$0			0		\$0	\$3,790,631	0.087	\$329,785
2052	9,000	11,400	2,400	\$1,595	\$3,827,792			0		\$0			0		\$0	\$3,827,792	0.082	\$313,879
2053	9,000	11,400	2,400	\$1,611	\$3,865,320			0		\$0			0		\$0	\$3,865,320	0.077	\$297,630
2054	9,000	11,400	2,400	\$1,626	\$3,903,216			0		\$0			0		\$0	\$3,903,216	0.073	\$284,935
2055	9,000	11,400	2,400	\$1,642	\$3,941,480			0		\$0			0		\$0	\$3,941,480	0.069	\$271,962
2056	9,000	11,400	2,400	\$1,658	\$3,980,120			0		\$0			0		\$0	\$3,980,120	0.065	\$258,708
2057	9,000	11,400	2,400	\$1,675	\$4,019,143			0		\$0			0		\$0	\$4,019,143	0.061	\$245,168
2058	9,000	11,400	2,400	\$1,691	\$4,058,547			0		\$0			0		\$0	\$4,058,547	0.058	\$235,396
2059	9,000	11,400	2,400	\$1,708	\$4,098,339			0		\$0			0		\$0	\$4,098,339	0.054	\$222,492
2060	9,000	11,400	2,400	\$1,724	\$4,138,518			0		\$0			0		\$0	\$4,138,518	0.051	\$211,956
TOTAL	450,000	570,000	120,000	67,377	161,705,964	0	0	0	0	0	0	0	0	0	0	161,705,964	15	41,783,290
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):																		\$41,783,290
Project Allocation:																		100.0%
Total Present Value of Discounted Benefits (Monetized Benefits):																		\$41,783,290
Narrative description of benefits: Based on cost of imported water purchased by member agencies if water from Lake Hodges is unavailable or unusable. If annual yield becomes usable, less imported water can be purchased. With the ability to pump water out of the reservoir during rain events, loss of water over the spillway may be lessened.																		
Comments:																		

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Table 15 - Total Water Supply Benefits (2009 dollars) Project: Lake Hodges Water Quality and Quagga Mitigation Measures			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$41,783,290	\$0	\$0	\$41,783,290
Comments:			

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Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Implementing Nutrient Management in the Santa Margarita River Watershed										
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)	
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0	
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0	
2011	\$98,601	\$0	\$0	\$0	\$0	\$0	\$98,601	0.89	\$87,755	
2012	\$197,133	\$0	\$0	\$0	\$0	\$0	\$197,133	0.84	\$165,592	
2013	\$197,133	\$0	\$0	\$0	\$0	\$0	\$197,133	0.79	\$156,129	
2014	\$197,133	\$0	\$0	\$0	\$0	\$0	\$197,133	0.75	\$147,258	
2015	\$377,500	\$0	\$0	\$0	\$0	\$0	\$377,500	0.71	\$266,138	
2016	\$377,500	\$0	\$0	\$0	\$0	\$0	\$377,500	0.67	\$251,038	
2017	\$377,500	\$0	\$0	\$0	\$0	\$0	\$377,500	0.63	\$236,693	
2018	\$377,500	\$0	\$0	\$0	\$0	\$0	\$377,500	0.59	\$223,480	
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.56	\$0	
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.53	\$0	
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.50	\$0	
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.47	\$0	
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.44	\$0	
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.42	\$0	
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.39	\$0	
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0	
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0	
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0	
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0	
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0	
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0	
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0	
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0	
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0	
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0	
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0	
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0	
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.19	\$0	
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0	
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0	
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0	
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0	
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0	
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
TOTALS	\$2,200,000	\$0	\$0	\$0	\$0	\$0	\$2,200,000	\$17	\$1,534,082	
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$	1,534,082
Comments: <i>Not applicable</i>										

Table 11

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Table 14 - Annual <u>Other</u> Water Supply Benefits (2009 dollars)						
Project: Implementing Nutrient Management in the Santa Margarita River Watershed						
(a) Year	(b) Type of Benefit: <i>Water Cost Savings</i> (C) Description of Benefit: <i>Reduced water costs to meet water quality objectives</i>	(b) Type of Benefit: (C) Description of Benefit:	(b) Type of Benefit: (C) Description of Benefit:	Discounting Calculations for Economic Benefits		
	(d) Annual Benefit (\$)	(d) Annual Benefit (\$)	(d) Annual Benefit (\$)			
				(d) Total Annual Benefits (\$)	(i) Discount Value	(j) Discounted Benefits [h x i]
2009				\$0	1.000	\$0
2010				\$0	0.943	\$0
2011				\$0	0.890	\$0
2012				\$0	0.840	\$0
2013				\$0	0.792	\$0
2014				\$0	0.747	\$0
2015				\$0	0.705	\$0
2016	\$2,372,576			\$2,372,576	0.665	\$1,577,763
2017	\$2,521,690			\$2,521,690	0.627	\$1,581,100
2018	\$2,691,919			\$2,691,919	0.592	\$1,593,616
2019	\$2,837,591			\$2,837,591	0.558	\$1,583,376
2020	\$2,985,719			\$2,985,719	0.527	\$1,573,474
2021	\$3,138,290			\$3,138,290	0.497	\$1,559,730
2022	\$3,295,439			\$3,295,439	0.469	\$1,545,561
2023	\$3,457,302			\$3,457,302	0.442	\$1,528,127
2024	\$3,624,021			\$3,624,021	0.417	\$1,511,217
2025	\$3,795,742			\$3,795,742	0.390	\$1,480,339
2026	\$3,972,614			\$3,972,614	0.371	\$1,473,840
2027	\$4,154,792			\$4,154,792	0.350	\$1,454,177
2028	\$4,342,436			\$4,342,436	0.331	\$1,437,346
2029	\$4,535,709			\$4,535,709	0.312	\$1,415,141
2030	\$4,734,780			\$4,734,780	0.294	\$1,392,025
2031	\$4,939,824			\$4,939,824	0.278	\$1,373,271
2032	\$5,151,019			\$5,151,019	0.262	\$1,349,567
2033	\$5,368,549			\$5,368,549	0.247	\$1,326,032
2034	\$5,592,606			\$5,592,606	0.233	\$1,303,077
2035	\$5,823,384			\$5,823,384	0.220	\$1,281,144
2036	\$6,061,085			\$6,061,085	0.207	\$1,254,645
2037	\$6,305,918			\$6,305,918	0.196	\$1,235,960
2038	\$6,558,095			\$6,558,095	0.185	\$1,213,248
2039	\$6,817,838			\$6,817,838	0.174	\$1,186,304
2040	\$7,085,373			\$7,085,373	0.164	\$1,162,001
2041	\$7,360,935			\$7,360,935	0.155	\$1,140,945
2042	\$7,644,763			\$7,644,763	0.146	\$1,116,135
2043	\$7,937,105			\$7,937,105	0.138	\$1,095,321
2044	\$8,238,219			\$8,238,219	0.130	\$1,070,968
2045	\$8,548,365			\$8,548,365	0.123	\$1,051,449
2046				\$0	0.116	\$0
2047				\$0	0.109	\$0
2048				\$0	0.103	\$0
2049				\$0	0.097	\$0
2050				\$0	0.092	\$0
2051				\$0	0.087	\$0
2052				\$0	0.082	\$0
2053				\$0	0.077	\$0
2054				\$0	0.073	\$0
2055				\$0	0.069	\$0
2056				\$0	0.065	\$0
2057				\$0	0.061	\$0
2058				\$0	0.058	\$0
2059				\$0	0.054	\$0
2060				\$0	0.051	\$0
TOTAL	\$151,893,698	\$0	\$0	\$151,893,698	\$11	\$40,866,899
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):						\$40,866,899
Project Allocation:						100.0%
Total Present Value of Discounted Benefits (Monetized Benefits):						\$40,866,899
Comments: Perry Louck of Rancho Water District indicated that on average RCWD discharges 4,000 acre feet per year under an agreement to the SMR Watermaster. RCWD is currently using MWD Tier 2 untreated water to make up these flows. With the project, treated recycled water could be used at a cost savings. Source: MWD, draft long term water rates presented at Member Agency Long Range Finance group (July 2010) through 2019 (after 2019, extended using 3% escalation per year)						

Table 14

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Table 15 - Total Water Supply Benefits (2009 dollars)			
Project: Implementing Nutrient Management in the Santa Margarita River Watershed			
(a) Total Discounted Water Supply Benefits	(b) Total Discounted Avoided Project Costs	(c) Other Discounted Water Supply Benefits	(d) Total Value of Discounted Benefits [a + c] or [b + c]
\$0	\$0	\$40,866,899	\$40,866,899
Comments:			

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Table 11 - Annual Cost of Project									
(All costs should be in 2009 dollars)									
Project: Bannock Ave. Neighborhood Streetscape Enhancements for Tecolote Creek Watershed Protection									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$2,945	\$0	\$0	\$0	\$0	\$0	\$2,945	1.00	\$2,945
2010	\$3,311	\$0	\$0	\$0	\$0	\$0	\$3,311	0.94	\$3,122
2011	\$3,311	\$0	\$0	\$0	\$0	\$0	\$3,311	0.89	\$2,947
2012	\$440,262	\$0	\$0	\$0	\$0	\$0	\$440,262	0.84	\$369,820
2013	\$1,675,354	\$0	\$0	\$0	\$0	\$0	\$1,675,354	0.79	\$1,326,881
2014	\$1,418,117	\$2,500	\$0	\$4,500	\$156,219	\$0	\$1,581,336	0.75	\$1,181,258
2015	\$0	\$2,500	\$0	\$4,500	\$151,063	\$0	\$158,063	0.71	\$111,435
2016	\$0	\$2,500	\$0	\$4,500	\$146,078	\$0	\$153,078	0.67	\$101,797
2017	\$0	\$2,500	\$0	\$4,500	\$141,258	\$0	\$148,258	0.63	\$92,958
2018	\$0	\$2,500	\$0	\$4,500	\$136,596	\$0	\$143,596	0.59	\$85,009
2019	\$0	\$2,625	\$0	\$4,725	\$132,089	\$0	\$139,439	0.56	\$77,807
2020	\$0	\$2,625	\$0	\$4,725	\$127,730	\$0	\$135,080	0.53	\$71,187
2021	\$0	\$2,625	\$0	\$4,725	\$123,515	\$0	\$130,865	0.50	\$65,040
2022	\$0	\$2,625	\$0	\$4,725	\$119,439	\$0	\$126,789	0.47	\$59,464
2023	\$0	\$2,625	\$0	\$4,725	\$115,497	\$0	\$122,847	0.44	\$54,298
2024	\$0	\$4,888	\$0	\$35,198	\$111,686	\$0	\$151,771	0.42	\$63,288
2025	\$0	\$2,888	\$0	\$5,198	\$108,000	\$0	\$116,085	0.39	\$45,273
2026	\$0	\$2,888	\$0	\$5,198	\$104,436	\$0	\$112,521	0.37	\$41,745
2027	\$0	\$2,888	\$0	\$5,198	\$100,990	\$0	\$109,075	0.35	\$38,176
2028	\$0	\$2,888	\$0	\$5,198	\$97,657	\$0	\$105,742	0.33	\$35,001
2029	\$0	\$4,000	\$0	\$41,497	\$94,434	\$0	\$139,931	0.31	\$43,659
2030	\$0	\$3,500	\$0	\$6,497	\$91,318	\$0	\$101,315	0.29	\$29,787
2031	\$0	\$3,500	\$0	\$6,497	\$88,305	\$0	\$98,301	0.28	\$27,328
2032	\$0	\$3,500	\$0	\$6,497	\$85,390	\$0	\$95,387	0.26	\$24,991
2033	\$0	\$3,500	\$0	\$6,497	\$82,573	\$0	\$92,569	0.25	\$22,865
2034	\$0	\$14,375	\$0	\$121,021	\$79,848	\$0	\$215,244	0.23	\$50,152
2035	\$0	\$4,375	\$0	\$8,121	\$77,213	\$0	\$89,709	0.22	\$19,736
2036	\$0	\$4,375	\$0	\$8,121	\$74,665	\$0	\$87,161	0.21	\$18,042
2037	\$0	\$4,375	\$0	\$8,121	\$72,201	\$0	\$84,697	0.20	\$16,601
2038	\$0	\$4,375	\$0	\$8,121	\$69,818	\$0	\$82,314	0.19	\$15,228
2039	\$0	\$10,250	\$0	\$52,182	\$67,514	\$0	\$129,946	0.17	\$22,611
2040	\$0	\$5,250	\$0	\$12,182	\$65,286	\$0	\$82,718	0.16	\$13,566
2041	\$0	\$5,250	\$0	\$12,182	\$63,132	\$0	\$80,563	0.16	\$12,487
2042	\$0	\$5,250	\$0	\$12,182	\$61,048	\$0	\$78,480	0.15	\$11,458
2043	\$0	\$5,250	\$0	\$12,182	\$59,034	\$0	\$76,465	0.14	\$10,552
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
TOTALS	\$3,543,300	\$123,188	\$0	\$424,011	\$3,004,031	\$0	\$7,094,529	\$17	\$4,168,512
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$4,168,512
Comments: It is anticipated that the assets will have a remaining value of \$1.75 million after 30 years, that is approximately 2.985 million of its total design and constructions cost will have been consumed and depreciated. This estimates that infrastructure will need to be replaced with same after 30 years. The storm drain bypass; the hydrodamic separator and bacterial treatment system will require major maintenance and cleaning at 5 years, 10 years, 15 years, 20 years, and 25 years in their useful life. Maintenance costs will increase in increments after the lifecycle milestones are past. Replacement cost is a straight line depreciation over 30 years of the assets constructed and installed in the project for which will need to be completely or significantly replaced.									

Table 11

**San Diego Integrated Regional Water Management
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Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Pilot Concrete Channel Infiltration Project									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0
2011	\$27,097	\$0	\$0	\$0	\$0	\$0	\$27,097	0.89	\$24,117
2012	\$306,303	\$0	\$0	\$0	\$0	\$0	\$306,303	0.84	\$257,178
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.79	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.75	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.70	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.67	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.63	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.59	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.56	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.53	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.50	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.47	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.44	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.42	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.39	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.18	\$0
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
TOTALS	\$333,400	\$0	\$0	\$0	\$0	\$0	\$333,400	\$17	\$281,294
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$281,294
Comments: Project not operational until 2012. Maintenance costs minimal post-construction. Would not anticipate anything more than the routine channel maintenance conducted by City.									

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
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Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: San Diego Regional Water Quality Assessment and Outreach Project									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0
2011	\$36,731	\$0	\$0	\$0	\$0	\$0	\$36,731	0.89	\$32,691
2012	\$275,887	\$2,500	\$110,526	\$7,125	\$0	\$1,099	\$397,137	0.84	\$333,595
2013	\$243,002	\$5,000	\$221,051	\$14,250	\$0	\$2,199	\$485,502	0.79	\$384,518
2014	\$111,380	\$2,500	\$110,526	\$7,125	\$0	\$1,100	\$232,630	0.75	\$173,775
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.71	\$0
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.67	\$0
2017	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.63	\$0
2018	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.59	\$0
2019	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.56	\$0
2020	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.53	\$0
2021	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.50	\$0
2022	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.47	\$0
2023	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.44	\$0
2024	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.42	\$0
2025	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.39	\$0
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.19	\$0
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0
TOTALS	\$667,000	\$10,000	\$442,102	\$28,500	\$0	\$4,398	\$1,152,000	\$17	\$924,578
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$924,578
Comments: Administration Cost includes salaries. Operation Cost includes salaries and contract fees. Maintenance Costs includes lab supplies. Other costs include salaries. This project incorporated no permanent facility or equipment that would generate operating expenses beyond the life of the project.									

Table 11

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
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Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Chollas Creek Integration Project									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0
2010	\$71,604	\$0	\$0	\$0	\$0	\$0	\$71,604	0.94	\$67,551
2011	\$196,760	\$0	\$0	\$0	\$0	\$0	\$196,760	0.89	\$175,116
2012	\$425,646	\$9,000	\$2,000	\$9,500	\$5,000	\$0	\$451,146	0.84	\$378,791
2013	\$300,490	\$7,200	\$2,000	\$9,000	\$2,500	\$0	\$321,190	0.79	\$254,413
2014	\$0	\$7,200	\$1,000	\$8,000	\$2,500	\$0	\$18,700	0.75	\$13,974
2015	\$0	\$7,200	\$500	\$7,000	\$0	\$0	\$14,700	0.70	\$10,363
2016	\$0	\$7,200	\$0	\$7,000	\$0	\$0	\$14,200	0.67	\$9,444
2017	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.63	\$6,651
2018	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.59	\$6,274
2019	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.56	\$5,919
2020	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.53	\$5,584
2021	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.50	\$5,268
2022	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.47	\$4,970
2023	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.44	\$4,688
2024	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.42	\$4,423
2025	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.39	\$4,173
2026	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.37	\$3,936
2027	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.35	\$3,714
2028	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.33	\$3,503
2029	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.31	\$3,305
2030	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.29	\$3,118
2031	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.28	\$2,942
2032	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.26	\$2,775
2033	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.25	\$2,618
2034	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.23	\$2,470
2035	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.22	\$2,330
2036	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.21	\$2,198
2037	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.20	\$2,074
2038	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.18	\$1,956
2039	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.17	\$1,846
2040	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.16	\$1,741
2041	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.15	\$1,643
2042	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.15	\$1,550
2043	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.14	\$1,462
2044	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.13	\$1,379
2045	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.12	\$1,301
2046	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.12	\$1,227
2047	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.11	\$1,158
2048	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.10	\$1,092
2049	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.10	\$1,031
2050	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.09	\$972
2051	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.09	\$917
2052	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.08	\$865
2053	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.08	\$816
2054	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.07	\$770
2055	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.07	\$727
2056	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$685
2057	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$647
2058	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$610
2059	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.05	\$575
2060	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.05	\$543
TOTALS	\$994,500	\$196,200	\$5,500	\$348,500	\$10,000	\$0	\$1,554,700	\$17	\$1,018,096
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$1,018,096
Comments: Administration and maintenace costs are anticipated to maintain the ripairan vegetation and remove trash from the restored area. Operations and replacement costs are limited to irrigation components for the first three years until the planted vegetation matures.									

Table 11

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
Appendix 7-2**

Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Chollas Creek Integration Project									
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0
2010	\$71,604	\$0	\$0	\$0	\$0	\$0	\$71,604	0.94	\$67,551
2011	\$196,760	\$0	\$0	\$0	\$0	\$0	\$196,760	0.89	\$175,116
2012	\$425,646	\$9,000	\$2,000	\$9,500	\$5,000	\$0	\$451,146	0.84	\$378,791
2013	\$300,490	\$7,200	\$2,000	\$9,000	\$2,500	\$0	\$321,190	0.79	\$254,413
2014	\$0	\$7,200	\$1,000	\$8,000	\$2,500	\$0	\$18,700	0.75	\$13,974
2015	\$0	\$7,200	\$500	\$7,000	\$0	\$0	\$14,700	0.70	\$10,363
2016	\$0	\$7,200	\$0	\$7,000	\$0	\$0	\$14,200	0.67	\$9,444
2017	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.63	\$6,651
2018	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.59	\$6,274
2019	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.56	\$5,919
2020	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.53	\$5,584
2021	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.50	\$5,268
2022	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.47	\$4,970
2023	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.44	\$4,688
2024	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.42	\$4,423
2025	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.39	\$4,173
2026	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.37	\$3,936
2027	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.35	\$3,714
2028	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.33	\$3,503
2029	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.31	\$3,305
2030	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.29	\$3,118
2031	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.28	\$2,942
2032	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.26	\$2,775
2033	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.25	\$2,618
2034	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.23	\$2,470
2035	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.22	\$2,330
2036	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.21	\$2,198
2037	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.20	\$2,074
2038	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.18	\$1,956
2039	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.17	\$1,846
2040	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.16	\$1,741
2041	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.15	\$1,643
2042	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.15	\$1,550
2043	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.14	\$1,462
2044	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.13	\$1,379
2045	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.12	\$1,301
2046	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.12	\$1,227
2047	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.11	\$1,158
2048	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.10	\$1,092
2049	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.10	\$1,031
2050	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.09	\$972
2051	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.09	\$917
2052	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.08	\$865
2053	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.08	\$816
2054	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.07	\$770
2055	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.07	\$727
2056	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$685
2057	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$647
2058	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.06	\$610
2059	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.05	\$575
2060	\$0	\$3,600	\$0	\$7,000	\$0	\$0	\$10,600	0.05	\$543
TOTALS	\$994,500	\$196,200	\$5,500	\$348,500	\$10,000	\$0	\$1,554,700	\$17	\$1,018,096
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$1,018,096
Comments: Administration and maintenace costs are anticipated to maintain the ripairan vegetation and remove trash from the restored area. Operations and replacement costs are limited to irrigation components for the first three years until the planted vegetation matures.									

Table 11

**San Diego Integrated Regional Water Management
Implementation Grant Proposal
Appendix 7-2**

Table 11 - Annual Cost of Project (All costs should be in 2009 dollars) Project: Regional Water Data Management Program										
Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
	Grand Total Cost from Table 7 (row (i), column (d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a)+...+(f)	Discount Factor	Discounted Costs (g) x (h)	
2009	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.00	\$0	
2010	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.94	\$0	
2011	\$65,961	\$0	\$0	\$0	\$0	\$0	\$65,961	0.89	\$58,705	
2012	\$91,577	\$0	\$0	\$0	\$0	\$0	\$91,577	0.84	\$76,925	
2013	\$45,789	\$0	\$0	\$0	\$0	\$0	\$45,789	0.79	\$36,265	
2014	\$175,000	\$0	\$0	\$0	\$0	\$0	\$175,000	0.75	\$130,725	
2015	\$175,000	\$0	\$0	\$0	\$0	\$0	\$175,000	0.71	\$123,375	
2016	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.67	\$14,630	
2017	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.63	\$13,794	
2018	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.59	\$13,024	
2019	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.56	\$12,276	
2020	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.53	\$11,594	
2021	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.50	\$10,934	
2022	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.47	\$10,318	
2023	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.44	\$9,724	
2024	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.42	\$9,174	
2025	\$0	\$0	\$0	\$22,000	\$0	\$0	\$22,000	0.39	\$8,580	
2026	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.37	\$0	
2027	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.35	\$0	
2028	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.33	\$0	
2029	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.31	\$0	
2030	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.29	\$0	
2031	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.28	\$0	
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.26	\$0	
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.25	\$0	
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.23	\$0	
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.22	\$0	
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.21	\$0	
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.20	\$0	
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.19	\$0	
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.17	\$0	
2040	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2041	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.16	\$0	
2042	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.15	\$0	
2043	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.14	\$0	
2044	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.13	\$0	
2045	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2046	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.12	\$0	
2047	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.11	\$0	
2048	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2049	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.10	\$0	
2050	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2051	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.09	\$0	
2052	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2053	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.08	\$0	
2054	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2055	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2056	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.07	\$0	
2057	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2058	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.06	\$0	
2059	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
2060	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.05	\$0	
TOTAL	\$553,327	\$0	\$0	\$220,000	\$0	\$0	\$773,327	\$17	\$540,043	
Project Life	Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, Column (c), Exhibit F: Proposal Costs and Benefit Summaries								\$540,043	
Comments:										

Table 11

